COMMITMENT
INTEGRITY
LEADERSHIP

March 24, 2022
Report 2021-117
FACT SHEET

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Electrical System Safety

California's Oversight of the Efforts by Investor-Owned Utilities to Mitigate the Risk of Wildfires Needs Improvement

Background

Since 2015 power lines have caused six of the State's 20 most destructive wildfires. Even as the threat of wildfire in California is increasing—especially in areas known as the *wildland-urban interface* where as many as 11 million Californians live—some ignition sources, such as vegetation contacting power lines, are preventable.

The California Public Utilities Commission (CPUC) is responsible for regulating certain electrical utilities and ensuring that the services and facilities those utilities provide do not constitute a threat to the public. The Office of Energy Infrastructure Safety reviews and approves utilities' mitigation plans and oversees utilities' compliance with those plans. A mitigation plan describes the preventive strategies and programs a utility will adopt to minimize the risk that its electrical lines and equipment will cause catastrophic wildfires. The Energy Safety Office also issues safety certifications to utilities, and these safety certifications affect the amounts utilities must reimburse the Wildfire Fund in certain situations.

Key Findings

- Utilities need to make further improvements to the electrical grid to reduce the risk of wildfires and to prevent power shutoffs and unplanned outages.
  - From 2013 through 2021, 67 power shutoffs affected more than 3.6 million customers, and a new state law could be strengthened by requiring that utilities identify the improvements that are necessary to prevent future power shutoffs.
- The Energy Safety Office awarded safety certifications to utilities despite serious deficiencies in their mitigation plans.
  - The Energy Safety Office approved mitigation plans and issued the 2020 safety certifications despite significant shortcomings in those mitigation plans. Whether a utility substantially implements its mitigation plan has no bearing on the office's issuance of its safety certification.
- The Energy Safety Office's mitigation plan approval process and the CPUC's audit process do not hold utilities sufficiently accountable.
  - The Energy Safety Office's 2022 guidelines do not require as a condition for approving mitigation plans that utilities clearly delineate how they will prioritize their mitigation work.
  - The CPUC conducts audits that assess whether utilities are in compliance with certain requirements, but it does not routinely audit all areas in the utilities' service territories, and it does not use its authority to penalize utilities when its audits uncover violations.

Key Recommendations

To mitigate the risk of utility-related wildfires, reduce the effect of power shutoffs, and hold utilities sufficiently accountable, the Legislature should do the following:

- Amend state law to require that utilities describe in their mitigation plans the improvements they would have to make to prevent power shutoffs on the parts of the electric grid routinely affected by them.
- Require that a utility only receive a safety certification when the Energy Safety Office's most recently completed compliance assessment of that utility's mitigation plan concludes that it has substantially implemented the plan.
- Require that the CPUC creates the following:
  - A risk-based audit plan for consistently auditing all utility service areas that prioritizes districts in high fire-threat areas.
  - A schedule of penalties for violations it identifies through its audits.

The Energy Safety Office should require that utilities' mitigation plans describe how they will prioritize their work before it approves those plans.

Electrical System Safety

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REPORT 2021-117

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March 24, 2022
2021-117

The Governor of California
President pro Tempore of the Senate
Speaker of the Assembly
State Capitol
Sacramento, California 95814

Dear Governor and Legislative Leaders:

From 2013 through 2021, investor-owned utilities (utilities) in California initiated 67 public safety power shutoffs (power shutoffs), affecting more than 3.6 million customers. In addition, as of June 2021, utilities reported that nearly 40,000 miles of bare power lines exist in high fire-threat areas. Those bare lines contribute to the need to use power shutoffs as a last resort to prevent wildfires, but the work necessary to improve the bare lines will cost billions of dollars.

In light of the dramatic impact of wildfires and power shutoffs, and to assess two oversight entities' roles in ensuring California's safe and reliable electrical system, the Joint Legislative Audit Committee directed my office to conduct an audit of the California Public Utilities Commission (CPUC) and the Office of Energy Infrastructure Safety (Energy Safety Office). We determined that utilities are making improvements to the electrical grid that are necessary to reduce the risk of wildfires and prevent power shutoffs, but even if all of the improvements they completed in 2020 consisted of replacing bare power lines in high fire-threat areas with covered or underground lines, they would have addressed only 4 percent of such lines.

As a result, the State must prioritize the areas utilities need to address first. A state law that took effect in January 2022 requires utilities to begin identifying sections of line that are regularly affected by power shutoffs and what they will do to reduce the need for and impact of future power shutoffs. The State could strengthen this law by requiring utilities to identify what is necessary to prevent future power shutoffs if the conditions leading to those shutoffs were to occur again, and to address a type of power outage caused by altering equipment settings that led to more than 600 unplanned power outages in 2021.

The Energy Safety Office's process for approving utilities' plans for mitigating the risk of wildfires does not ensure that the improvements are in high fire-threat areas. The office approved plans despite some utilities' failure to demonstrate that they are appropriately prioritizing their mitigation activities, and subsequent reviews have found that some utilities failed to focus their efforts in high fire-threat areas. The CPUC also conducts audits to determine whether utilities comply with rules designed to ensure that they are operating safely, but it did not audit all utility service territories on a consistent basis, did not audit several areas that include high fire-threat areas, and has not used its authority to penalize utilities when its audits uncover violations.

Respectfully submitted,

MICHAEL S. TILDEN, CPA
Acting California State Auditor

Selected Abbreviations Used in This Report

CPUC	California Public Utilities Commission
EPIC	Electric Program Investment Charge
PG&E	Pacific Gas and Electric
RAMP	Risk Assessment Mitigation Phase
SCE	Southern California Edison
SDG&E	San Diego Gas and Electric

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SUMMARY

Over the past decade, California has experienced some of its most devastating and costly wildfires. Utility-caused fires are often more destructive than those resulting from other sources because many occur in remote areas during high wind events, and those same weather conditions cause the fire to spread quickly, making it difficult to control. Since 2015 power lines have caused six of the State's 20 most destructive wildfires. Six investor-owned utilities (utilities) that serve much of California are regulated by the California Public Utilities Commission (CPUC). In addition, the Office of Energy Infrastructure Safety (Energy Safety Office/office) within the Natural Resources Agency oversees and enforces utilities' compliance with wildfire safety requirements.[1] It also approves wildfire mitigation plans (mitigation plans) that describe the strategies and programs a utility will adopt to minimize the risk of catastrophic wildfires caused by its electrical lines and equipment. One of these strategies is the use of public safety power shutoffs (power shutoffs), which utilities have used to prevent fires when strong winds, low humidity, and related conditions are present. However, doing so leaves communities and essential facilities without power, imposing hardships and increased risks, including the inability of the disabled and others to rely on electric-powered devices and life support equipment.

Utilities Will Need to Make Further Improvements to the Electrical Grid to Reduce the Risk of Wildfires and to Prevent Power Shutoffs and Unplanned Outages

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California is at a higher risk of wildfires and more frequent power shutoffs in part because of the nearly 40,000 miles of bare power lines in areas where there is a greater threat of wildfire. In 2020 the six utilities reported completing hardening projects—improvements to make electrical equipment more fire resistant or to reduce the risk of them igniting a fire—on only 1,540 miles of lines. The cost of making the improvements on all 40,000 miles of bare power lines in high fire-threat areas is generally significant, and because these costs are included in the utilities' rates, could pose a substantial burden to ratepayers.

In January 2022, a new state law (shutoff reduction law) began requiring that utilities identify circuits—sections of power lines within a utility's electrical grid—that have been subject to frequent power shutoffs, and the improvements the utilities have already taken or plan to take to reduce the need for and impact of future power shutoffs. According to CPUC data, there were 67 power shutoffs

[1] We use the term *Energy Safety Office* to refer to either the CPUC's Wildfire Safety Division or the Office of Energy Infrastructure Safety depending on when actions occurred. The Legislature transferred all the functions of the Wildfire Safety Division to the Office of Energy Infrastructure Safety effective July 1, 2021. Thus, the actions we describe in the text that occurred prior to July 1, 2021, were taken by the Wildfire Safety Division and any actions that occurred after were taken by the Office of Energy Infrastructure Safety.

from 2013 through 2021, de-energizing thousands of circuits across California and affecting more than 3.6 million customers. The shutoff reduction law could be strengthened by requiring that utilities identify the improvements that are necessary to *prevent* future power shutoffs on those circuits, such as moving power lines underground. This law could also be amended to address a type of power outage that is occurring more frequently. Specifically, some utilities have altered settings on equipment that have resulted in unplanned outages. Although taking such action may prevent wildfires, one utility's alteration of electrical equipment settings caused hundreds of unplanned power outages from July through November 2021 with no advance notice. Despite the adverse impacts these outages cause, the Energy Safety Office does not consider the requirements of the shutoff reduction law to apply to this type of outage and thus, it has not issued guidelines regarding utilities use of them.

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The Energy Safety Office Awarded Safety Certifications to Utilities Despite Serious Deficiencies in Their Mitigation Plans

The Energy Safety Office must issue safety certifications to utilities that demonstrate they meet certain criteria established in law—such as having an approved mitigation plan. These safety certifications affect requirements for utilities to repay certain amounts to a fund they can use to help pay for the costs of wildfires they cause. The Energy Safety Office issued the 2020 safety certifications to the three largest utilities, even though it identified serious deficiencies in each of their mitigation plans. Although for 2021 the Energy Safety Office no longer approved mitigation plans without the utility first addressing critical issues, we question the appropriateness of the process it followed to approve mitigation plans and issue the 2020 safety certifications. In addition, the law does not allow the Energy Safety Office to deny a safety certification based on a utility's failure to implement a prior mitigation plan—state law requires the Energy Safety Office to consider whether a utility is in the process of implementing its most recently approved mitigation plan when issuing a safety certification. Thus, whether a utility has previously implemented its mitigation plan has no bearing on the office's decision to issue its safety certification.

The Energy Safety Office's Mitigation Plan Approval Process and the CPUC's Audit Process Do Not Hold Utilities Sufficiently Accountable

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The Energy Safety Office approved utilities' mitigation plans despite some utilities' failure to demonstrate that they are appropriately prioritizing their mitigation activities. As referenced earlier, utilities reported that their hardening projects had addressed relatively few miles of bare power lines in high fire-threat areas during 2020. However, we found that the Energy Safety Office approved mitigation plans that did not provide adequate information on how utilities prioritized those projects. For example, the office conditionally approved Pacific Gas and Electric's (PG&E's) 2020 mitigation plan in June 2020 even though it found that PG&E had not described where vegetation management—trimming trees and vegetation from around power lines—was most necessary. Further, a court-established Federal Monitor found that PG&E had conducted a certain type of vegetation management in relatively low-risk portions of its power grid instead of in high fire-threat areas and had not conducted planned inspections of some equipment in its highest threat areas. Nevertheless, the Energy Safety Office guidelines for 2022 mitigation plans do not require that the utilities clearly delineate in their plans where mitigation activities will occur. As a result of this weakness, the Energy Safety Office does not assess whether utilities plan to conduct these mitigation activities in areas of highest risk for wildfire as a condition for approving their mitigation plans.

Moreover, the CPUC conducts audits to determine whether utilities are in compliance with rules designed to ensure that they are operating safely, but those audits could be improved to better ensure such compliance, thereby helping mitigate the risk of utility-caused wildfires. Specifically, the CPUC does not consistently audit all areas in the utilities' service territories, it did not audit several areas that include high fire-threat areas, and it does not use its authority to penalize utilities when its audits uncover violations.

Summary of Recommendations

Legislature

To reduce the number of power shutoffs, rather than only reducing their scope and impact, the Legislature should amend the shutoff reduction law to require that utilities describe in their mitigation plans the improvements that would be necessary to prevent power shutoffs on the circuits routinely affected by them, such as installing covered power lines.

To address the risks and hazards resulting from future unplanned outages, the Legislature should amend the shutoff reduction law to include circuits frequently de-energized as a result of utilities altering settings on equipment.

To ensure that safety certifications encourage utilities to invest in safety and limit wildfire risks, the Legislature should require that, as a prerequisite to issuing a safety certification, the Energy Safety Office's most recently completed compliance assessment of a utility's mitigation plan must conclude that the utility has substantially implemented that plan.

To better hold utilities accountable for safely operating the electrical grid, the Legislature should require the CPUC to do the following:

- Create a risk-based audit plan for consistently auditing all utility service areas and prioritizing districts in high fire-threat areas.
- Create a schedule of penalties for violations identified through its audit process and apply the schedule pursuant to its existing authority to impose penalties as established in state law.

Energy Safety Office

To ensure that utilities are targeting the areas of highest fire risk for mitigation activities, the Energy Safety Office should designate the prioritization of mitigation activities as a critical issue that must be addressed by utilities before it approves mitigation plans.

Agency Comments

The CPUC generally agreed with our recommendations. The Energy Safety Office disagreed with several of our conclusions and recommendations.

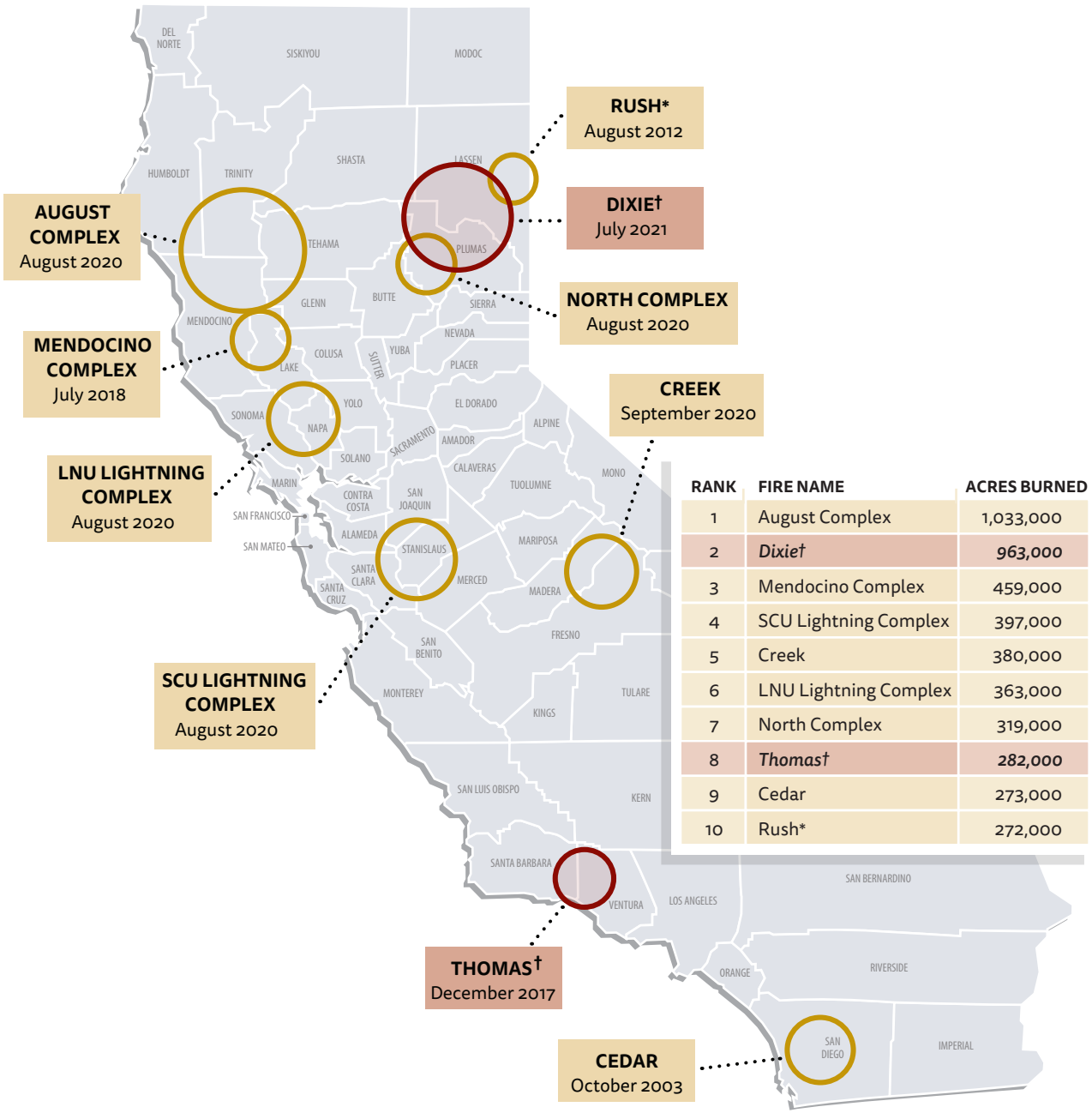
Introduction

Background

Over the past decade, California has experienced some of its most devastating and costly wildfires. There are three elements required to start a fire: fuel (such as dry vegetation), oxygen, and heat (an ignition source). According to the state fire marshal, wildfires are inevitable throughout most of California. However, some ignition sources, such as vegetation contacting power lines and causing sparks, are preventable. Further, a California Department of Forestry and Fire Protection (Cal Fire) assistant deputy director stated that fires caused by utilities (utility-caused fires) are often more destructive than those resulting from other sources because many utility-caused fires occur in remote areas during high-wind events—bringing branches, trees, or debris in contact with power lines and sparking fires—which cause the fires to spread rapidly. A 2020 California Public Utilities Commission (CPUC) report also noted that a growing population in areas where human development meets combustible wildland vegetation results in more communities exposed to wildfire risk and in more electrical infrastructure being built in wildfire-prone areas—where downed power lines may come into contact with fuels, or objects such as trees may come into contact with power lines, potentially generating sparks that ignite wildfires.

Addressing preventable ignition sources has become critical as wildfires have grown larger and more destructive. As Figure 1 shows, eight of the 10 largest California wildfires have occurred during the past five years, including the 2017 Thomas Fire and the 2021 Dixie Fire, which were both caused by utilities. According to Cal Fire, fires caused by electrical power—such as electrical power distribution or transmission equipment—accounted for about 10 percent of all wildfires in the areas for which it has responsibility each year from 2016 through 2020, as Table 1 shows. Once the fire starts, the same weather conditions that contribute to electrical power-caused fires—the most critical of which is high wind—also cause the fire to spread rapidly and make it difficult to control. Since 2015 power lines have caused six of the State's 20 most destructive wildfires. The State's fourth climate change assessment report issued in 2018 indicates that under a scenario in which changes do not occur to reduce emissions, by 2100 the average area burned by wildfires in California will increase by 63 percent.

Figure 1
Utilities Caused Two of the 10 Largest Wildfires in California From 1932 Through 2021



RANK	FIRE NAME	ACRES BURNED
1	August Complex	1,033,000
2	*Dixie†*	***963,000***
3	Mendocino Complex	459,000
4	SCU Lightning Complex	397,000
5	Creek	380,000
6	LNU Lightning Complex	363,000
7	North Complex	319,000
8	*Thomas†*	***282,000***
9	Cedar	273,000
10	Rush*	272,000

Source: Cal Fire's website, National Interagency Fire Center's website, and Cal Fire's 2020 Fire Siege report.

Notes: As of October 25, 2021, these are the 10 largest fires that Cal Fire has identified since 1932, regardless of jurisdiction or whether they were federal, state, or local responsibility.

Fire location is not to scale, is approximate, and does not represent the exact boundaries of the fire.

* This fire burned an additional 44,000 acres in Nevada.

† This wildfire was caused by power lines.

Table 1
Wildfires Caused by Electrical Power Account for 19 Percent of Cal Fire-Reported Acres Burned 2016 Through 2020

	WILDFIRES		WILDFIRES CAUSED BY ELECTRICAL POWER			
YEAR	TOTAL WILDFIRES	TOTAL ACRES BURNED	NUMBER	PERCENT	ACRES BURNED	PERCENT
2016	2,816	245,000	270	10%	3,000	1%
2017	3,470	467,000	408	12	250,000	54
2018	3,504	1,063,000	297	8	247,000	23
2019	3,086	130,000	304	10	84,000	65
2020	3,501	1,459,000	335	10	59,000	4
Totals	**16,377**	**3,364,000**	**1,614**	**10%**	**643,000**	**19%**

Source: Cal Fire's Wildfire Activity Statistics reports, 2016 through 2020.
Note: These data consist primarily of wildfire incidents within the Cal Fire direct protection area responded to by Cal Fire personnel.

Not only has average wildfire size and the area burned annually increased, the cost of combating the fires has grown. From fiscal years 2016–17 through 2020–21, the State's annual expenditures for Cal Fire—the state agency responsible for providing fire protection and prevention—nearly doubled, from $1.9 billion to an estimated $3.5 billion. According to the National Interagency Fire Center database for large wildfires and other significant events, as of December 2021 California's large fires in that year cost $2.6 billion to suppress—accounting for more than half of the $4.3 billion of such costs reported nationally. In addition, these data show that the total cost of suppressing large wildfires in California from 2015 through 2021 was more than $9.1 billion.

Wildfires result in many additional costs beyond the cost of suppressing them. A 2018 research report, funded in part by the U.S. Forest Service, described both short-term wildfire costs—such as those for suppressing the fire, evacuation services, relief aid, and home and property losses—and longer-term damage—such as habitat restoration, business losses, and medical costs, including those associated with exposure to smoke. This research estimated that suppression costs represent only 9 percent of total wildfire costs. The other costs of wildfires have been significant, and not all of them are financial costs. In the last six years, California wildfires have killed nearly 200 people and damaged or destroyed more than 53,000 structures. The California Natural Resources Agency's communications director indicated that the State does not regularly track or estimate the cost of wildfires in a way that accounts for public health costs or ecological damage. Other research has attempted to estimate these costs. For example, researchers from several international universities conducted an analysis of California's 2018 wildfires that suggests that the economic impact

of wildfires may be significantly larger than the cost of suppressing them and may affect economic activities in areas beyond the location of the physical destruction or smoke. That analysis calculated suppression costs for California's 17 largest wildfires in 2018 to be nearly $1 billion but estimated that the damage totaled $149 billion, including destroyed and damaged buildings and infrastructure, health costs, and economic losses.

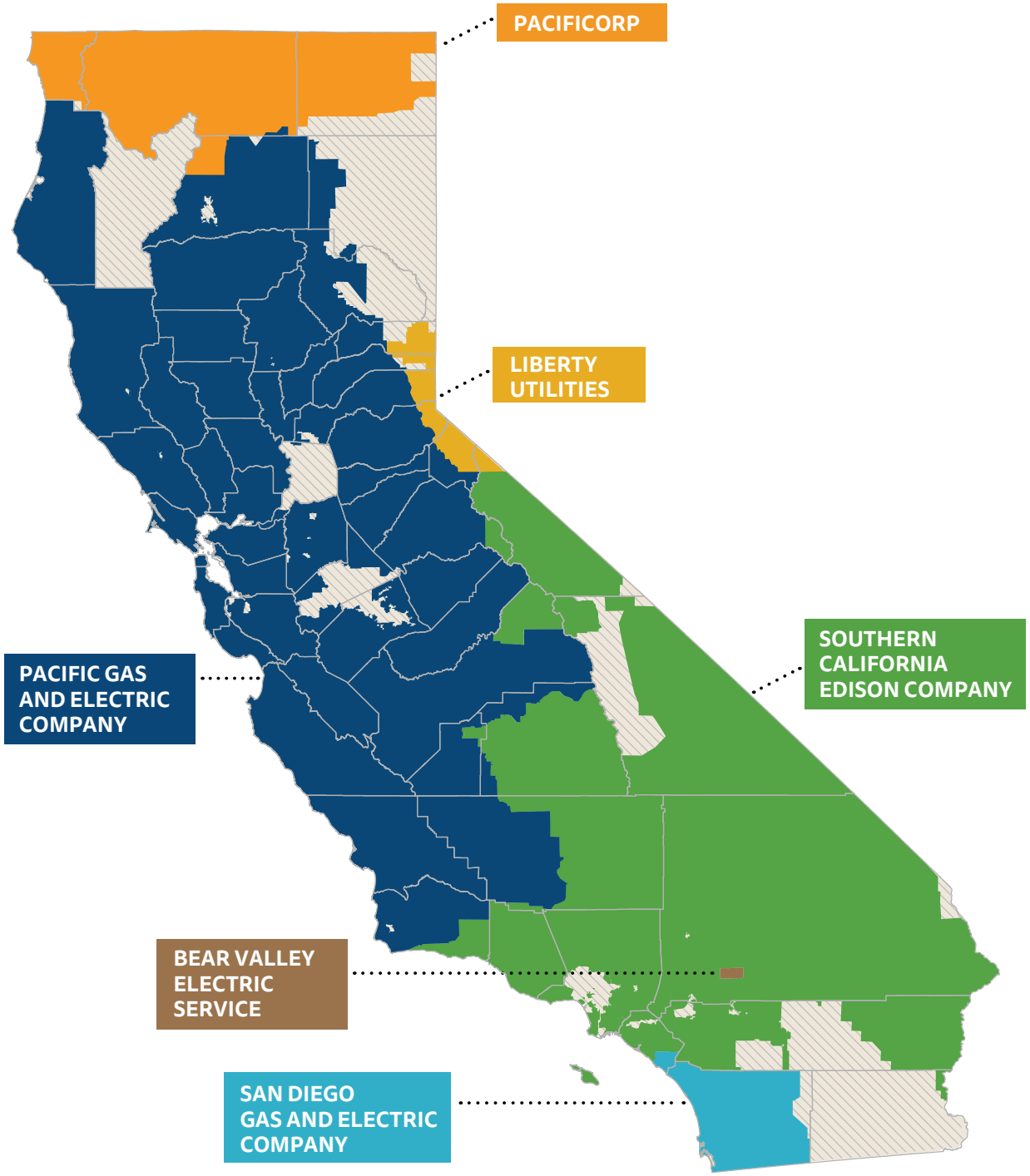
In a 2020 report, the CPUC's Wildfire Safety Division recognized that the threat of wildfire is increasing and that utility-related ignitions are responsible for a "disproportionate" share of wildfire-related consequences. According to a 2019 report from a gubernatorial strike force, more than a quarter of California's population—about 11 million people—live in areas where human development meets combustible wildland vegetation, known as the *wildland-urban interface*, and there are an estimated 4.5 million homes in that interface. The number of people living in the interface will continue to rise if nationwide trends continue. Further, there is significant overlap between the wildland-urban interface and the areas the CPUC considers high fire-threat areas.

Oversight of the State's Electrical Grid

The electrical grid is a network of components, including transmission and distribution lines (power lines), substations, and transformers. Power plants generate electricity, but electricity must have a path, or circuit, in order to travel to homes and businesses where it is used. Generally, there are two classifications of power lines carrying electricity from one location to another. High-voltage transmission lines, such as those that hang between tall metal towers, carry electricity over long distances. Higher voltage electricity is more efficient and less expensive for long-distance electricity transmission than lower voltage. Transformers at substations reduce the voltages from long-distance transmission lines before electricity is transferred to the distribution lines that carry it to homes and businesses. Several types of entities provide electricity in California, including publicly owned utilities, rural electric cooperatives, and investor-owned utilities. Investor-owned utilities (utilities) are privately owned utilities whose stock is publicly traded. Six such utilities serve much of California, as Figure 2 shows.[2] State law requires utilities to provide adequate, efficient, just, and reasonable service, and the Legislature considers electricity essential to the health, safety, and economic well-being of all California consumers.

[2] Our use of the term *utilities* in this report refers to a subset known as electrical corporations.

Figure 2
Investor-Owned Electric Utilities Served Most of the State in 2020



Source: California Energy Commission and utility district maps.

Note: The unmarked areas of the map are served by other types of electric utilities, such as publicly owned utilities and rural electric cooperatives.

The CPUC has the authority to regulate utilities. Through a process known as a *general rate case*, described in more detail below, the CPUC approves utility cost and spending plans in the first phase of the process, which are the basis for the rates utilities charge consumers that it approves in the second phase of the process. The Governor appoints and the Senate approves the CPUC's five commissioners (the Commission), and a portion of the CPUC's revenue comes from fees it imposes on utilities. The CPUC is responsible for implementing and enforcing standards for the maintenance and operation of facilities that generate electricity that are owned by a utility or located in the State. The CPUC has also stated that it is responsible for ensuring that the utilities it regulates are providing service and facilities that do not constitute a threat to the public or the environment. For fiscal year 2020–21, it spent nearly $740 million and had a staff of 581 employees responsible for its regulatory function, as Table 2 shows. The scope of the CPUC's oversight is significant given the size of the entities it oversees. The six utilities collectively employed more than 47,000 individuals and had revenues of nearly $43 billion in 2020. The CPUC also regulates privately owned communications, natural gas, and water companies, in addition to overseeing railroad and rail transit, moving, and transportation companies.

Table 2
Electric Utility Regulation Is a Small Portion of the CPUC's Total Expenditures

	CPUC REGULATORY EXPENDITURES			
FISCAL YEAR	TOTAL CPUC STAFF POSITIONS	TOTAL REGULATORY EXPENDITURES	REGULATORY EXPENDITURES FOR ELECTRIC UTILITIES*	PERCENT OF REGULATORY EXPENDITURES FOR ELECTRIC UTILITIES
2016–17	432	$671,000,000	$57,000,000	8%
2017–18	419	598,000,000	59,000,000	10
2018–19	411	717,000,000	72,000,000	10
2019–20	496	837,000,000	130,000,000	16
2020–21	581	737,000,000	101,000,000	14

Source: State budgets for fiscal years 2016–17 through 2020–21, CPUC accounting data, and interviews with CPUC staff.

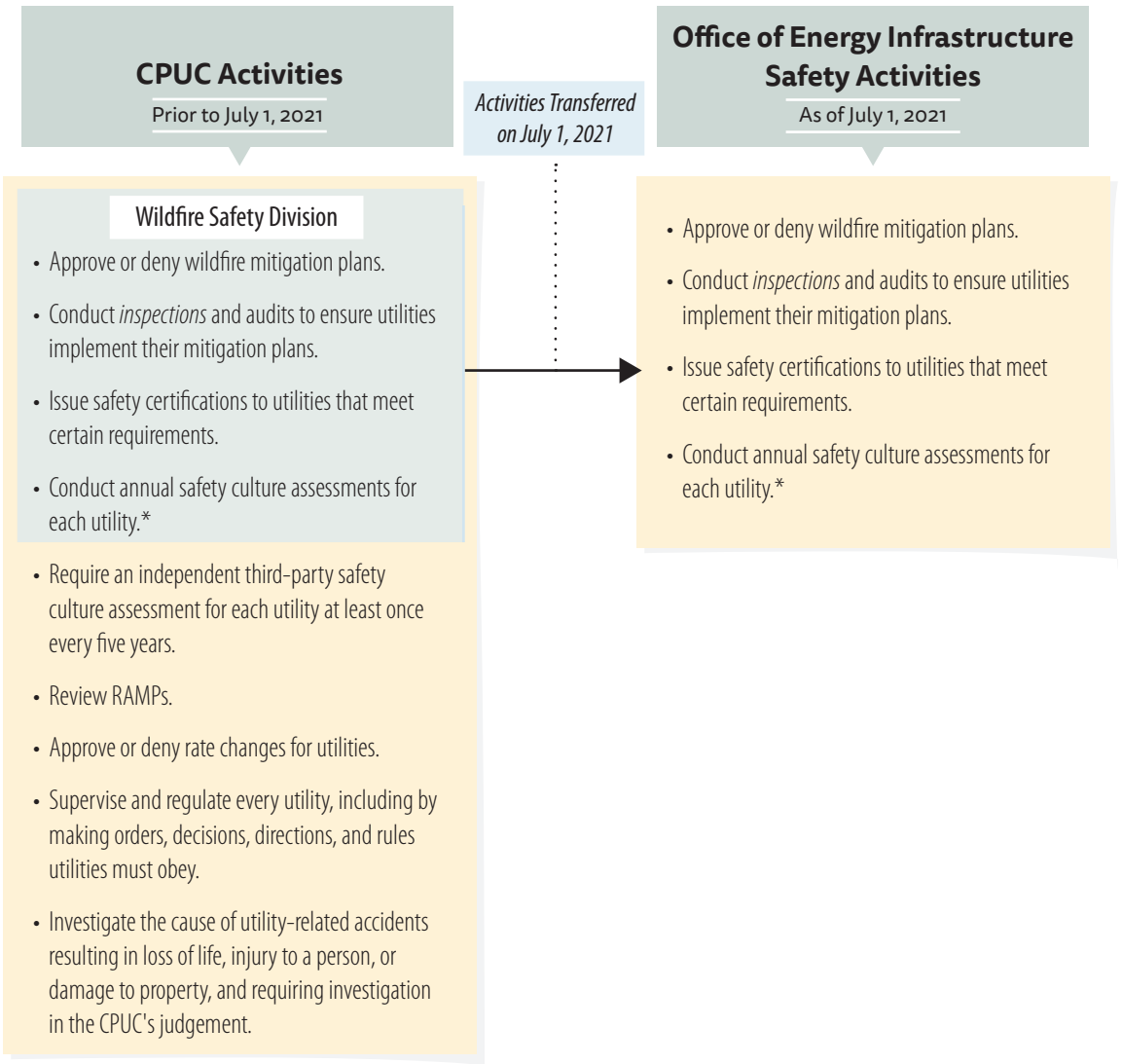
Note: The CPUC regulates the six utilities, as well as privately owned telecommunications, natural gas, and water companies, in addition to overseeing railroad and rail transit, moving, and transportation companies.

* The CPUC indicates there may be additional legal, administrative law judge, and other divisional costs pertaining to electric utilities that are not included in this total, and some figures may include expenditures for activities unrelated to electricity, such as costs related to regulating a utility that provides both gas and electricity.

The CPUC approves the rates that utilities can charge for electricity every four years. Through the general rate case process—which is overseen by a commissioner and CPUC's administrative law judges—the utilities request the CPUC's approval for rate changes based on the revenue required to pay for their operating expenses and capital costs (revenue requirement). According to the CPUC, utilities may also request additional revenues and rate changes in between general rate cases, in some circumstances. The revenue requirement consists of a number of factors, such as the utility's normal business expenses, depreciation, and taxes; and it is the basis for designing the rates consumers are charged. Since 2015 the CPUC has required California's large utilities—Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric Company (SDG&E), and Southern California Edison Company (SCE)—to file a Risk Assessment Mitigation Phase (RAMP) proceeding in advance of their general rate cases. A RAMP proceeding examines a utility's assessment of its key risks, including those posed by wildfires, and its proposals for mitigating those risks, and the CPUC requires the utility to incorporate the results of its RAMP proceeding into its general rate case.

The CPUC is also responsible for ensuring the protection and safety of utility customers at large, and it exercises its regulatory authority in part by issuing *General Orders* that govern the activity of multiple utilities under its jurisdiction. A General Order has the force and effect of law, and its violation may result in penalties. To ensure that utilities are following the construction, maintenance, and inspection requirements outlined in its General Orders, the CPUC performs audits of the utilities. It also investigates certain wildfires, including those caused by utilities, to assess utilities' compliance with applicable rules and regulations. To oversee and enforce utilities' compliance with wildfire safety requirements, the Legislature required the CPUC to create the Wildfire Safety Division by January 1, 2020. The Legislature also established the Office of Energy Infrastructure Safety (Energy Safety Office/office) within the California Natural Resources Agency and, effective July 1, 2021, transferred the activities of the CPUC's Wildfire Safety Division to that office, as Figure 3 shows. Because the director, the staff, and the activities of the Wildfire Safety Division were transferred to the Energy Safety Office, for the purposes of this report, we use the term *Energy Safety Office* to refer to both the newly formed Office of Energy Infrastructure Safety and the Wildfire Safety Division that previously existed as a part of the CPUC.

Figure 3
State Law Shifted Certain Activities From the CPUC to the Office of Energy Infrastructure Safety


CPUC Activities
Prior to July 1, 2021
Activities Transferred on July 1, 2021
Office of Energy Infrastructure Safety Activities
As of July 1, 2021
Wildfire Safety Division
• Approve or deny wildfire mitigation plans.
• Conduct inspections and audits to ensure utilities implement their mitigation plans.
• Issue safety certifications to utilities that meet certain requirements.
• Conduct annual safety culture assessments for each utility.*
• Require an independent third-party safety culture assessment for each utility at least once every five years.
• Review RAMPs.
• Approve or deny rate changes for utilities.
• Supervise and regulate every utility, including by making orders, decisions, directions, and rules utilities must obey.
• Investigate the cause of utility-related accidents resulting in loss of life, injury to a person, or damage to property, and requiring investigation in the CPUC's judgement.
• Approve or deny wildfire mitigation plans.
• Conduct inspections and audits to ensure utilities implement their mitigation plans.
• Issue safety certifications to utilities that meet certain requirements.
• Conduct annual safety culture assessments for each utility.*

Source: State law and CPUC rulemaking.

* Safety culture assessments evaluate how effectively an organization embraces and practices safety.

The Energy Safety Office is a relatively small organization, with only 30 employees as of January 2022. State law assigns it the responsibility for reviewing and approving utilities' wildfire mitigation plans (mitigation plans) and overseeing utilities' compliance with approved mitigation plans. Among other things, mitigation plans describe the preventive strategies and programs a utility will adopt to minimize the risk that its electrical lines and equipment will cause catastrophic wildfires. The Energy Safety Office is also responsible for issuing safety certifications

to utilities that meet certain requirements outlined in state law. Safety certifications affect the amount utilities must reimburse the Wildfire Fund in certain situations—described in more detail below—which is intended to provide electrical corporations that are safe actors a mechanism to guard against the financial effects of wildfires that is more cost-effective than traditional insurance.

The Legislature established the Wildfire Fund in 2019 to pay for certain claims against utilities for damages due to wildfires they cause, to support the creditworthiness of utilities, and to reduce the cost to ratepayers in addressing utility-caused catastrophic wildfires. The Wildfire Fund is funded through a loan from the State's surplus money investment fund, contributions from participating utilities, and surcharges on some of the utilities' ratepayers, with a goal of ultimately reaching a claim-paying capacity of approximately $21 billion. Each large utility—PG&E, SCE, and SDG&E—participates in the Wildfire Fund, and according to the Wildfire Fund administrator, the balance was nearly $11 billion as of December 2021.

Participating utilities may seek payment from the Wildfire Fund to satisfy third-party claims for covered wildfires that exceed the greater of $1 billion in any year or the amount of insurance the utility must maintain. State law requires participating utilities to maintain reasonable insurance coverage, the amount of which the fund administrator must periodically review and recommend. In general, utilities must reimburse the fund for costs that the CPUC determines are not just and reasonable. By law, utilities with a valid safety certification for the period in which the wildfire ignited are presumed to have acted reasonably, and if the CPUC determines the costs for which they claim reimbursement are not just and reasonable, the amount the utility must reimburse the Wildfire Fund is capped.

However, if the CPUC determines that the utility's costs were not reasonable and it did not have a safety certification or the fund administrator determines that its actions or inactions constituted a conscious or willful disregard of the rights and safety of others, the utility must reimburse the Wildfire Fund in full. As of December 2021, none of the participating utilities had made a claim on the Wildfire Fund. However, in a quarterly report to the Securities and Exchange Commission, PG&E indicated that to the extent liabilities related to the 2021 Dixie Fire exceeded $1 billion, it was eligible to make a claim to cover the excess amount, and that as of September 2021, it had recorded an accounting entry for probable recoveries of $150 million from the Wildfire Fund in connection with that fire.

Power Shutoffs Can Be Effective in Preventing Potential Wildfire Ignitions During Certain Conditions

State law declares that reliable electric service is of utmost importance to the safety, health, and welfare of the State's citizenry and economy. However, in a 2012 decision, the CPUC concluded that utilities have the authority under state law to proactively shut off electric power to customers when it is necessary to protect public safety. Such actions are known as public safety power shutoffs (power shutoffs). Utilities use these power shutoffs when they deem it necessary for public safety, such as to prevent fires when strong winds, low humidity, and related conditions are present. However, doing so leaves consumers, communities, and essential facilities, such as hospitals and fire departments, without power from the electrical grid, thereby imposing increased risks and hardships.

In an effort to better prepare the public and local officials for power shutoffs, the Commission adopted a resolution in 2018 to, among other things, increase communication and notify customers as soon as practicable before the power shutoff and to require utilities to submit a post-event report to the CPUC within 10 days after each shutoff. From 2019 through 2021, the Commission expanded the power shutoff guidelines that utilities must follow. For example, a utility must now include in its post-event report the alternatives it considered before it initiated the power shutoff. The CPUC also requires that a utility report on how it determined that the benefits of a power shutoff outweighed potential public safety risks and use a power shutoff only as a mitigation measure of last resort.

All three large utilities (PG&E, SCE, and SDG&E) noted in their 2021 mitigation plan updates that power shutoffs are a necessary fire prevention mechanism of last resort. All six of the utilities describe power shutoffs in their mitigation plans and four of them have implemented power shutoffs in the past. The decision to de-energize electric facilities for public safety depends on several factors, including the dryness of vegetation near power lines and local weather conditions, such as wind speed and humidity. Extended droughts, extreme wind events, and the relative dryness of the surrounding vegetation—among other things—can propagate large wildfires.

As the State's risk of wildfire has increased, power shutoffs have proven effective at preventing possible ignitions resulting from broken equipment and hazards during high wind conditions, such as tree limbs blown onto power lines. After a utility concludes a power shutoff, the CPUC requires the utility to submit a post-event report that details, among other things, any wind-related damage to overhead power lines where power was shut off. Our review

of 15 such reports found that 11 of them described wind-related damage, including vegetation in direct contact with power lines and damage to electrical equipment, such as broken power poles, that might have ignited a wildfire had the power not been shut off. In two of these reports, the utilities indicated there were more than a hundred instances of wind-related damage to equipment. Until utilities make improvements to power lines to withstand such weather conditions without the risk of igniting a wildfire, de-energizing power lines will continue to be a necessary mitigation tool to protect the public.

Although they prevent wildfires, power shutoffs can have a number of adverse effects. As Appendix B shows, during 2019 and 2020, individual power shutoffs affected anywhere from fewer than 20 people to more than 940,000. Power shutoffs affect public safety in a variety of ways, as the text box shows. Further, they can be very costly. A 2019 SCE study surveyed customers to collect detailed information on the costs that they incur during power outages. The study found that the costs varied based on the length of the outage, but it estimated that the average cost to residential and small or medium business customers were $0.07 and nearly $21 per minute of the power outage, respectively, which SCE stated generally aligned with those of a 2012 PG&E study. Based on these figures, a power shutoff lasting 10 hours would cost a residential customer $42 and a small or medium business $12,600. A February 2021 report published by the Lawrence Berkeley National Laboratory that cited the SCE study, described limitations of outage data collected through surveys, such as SCE's study, including possible biases, and consequences and costs that the respondent does not consider. Although SCE's estimates may not be the most precise measure of all outage-related costs, the cost of the 62 power shutoffs for which there was duration information was more than $21 billion in total—based on the SCE average cost estimates for residential and small or medium business customers. The majority of those costs are the result of two PG&E outages in 2019 with costs that totaled more than $14 billion. In its 2020 utility wildfire mitigation strategy, the Energy Safety Office emphasized that the State's leadership and residents view the magnitude of past years' power shutoff events as unacceptable and that utilities must minimize the need to use power shutoffs as a wildfire mitigation tool.

A power shutoff event can have significant adverse impacts on the general public, including the following:

- Inability of the disabled, the elderly, and the medically fragile to rely on electric-powered devices and life-support equipment, such as hemodialysis machines and respirators.
- Loss of news services to disseminate emergency information to the public.
- Increased risk of vehicle accidents due to loss of functioning traffic and street lights.
- Significant costs incurred by utility customers, such as businesses.
- Unique hardships suffered by economically disadvantaged utility customers.
- Increased dangers from the use of portable generators, such as fire ignition risk.
- Adverse impact on water supply, sewage services, and sanitary services.

Source: Commission decisions from 2009 and 2021, and the CPUC's website.

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Utilities Will Need to Make Further Improvements to the Electrical Grid to Reduce the Risk of Wildfires and to Prevent Power Shutoffs and Unplanned Outages

Key Points:

- There is a higher risk of wildfires and power shutoffs in California in part because of the nearly 40,000 miles of bare power lines in areas with a greater threat of wildfires. In 2020 the six utilities reported hardening projects—improvements to make electrical equipment more fire resistant or to reduce the risk of equipment igniting a fire—on only 1,540 miles of lines.

- In January 2022, a new state law began requiring utilities to identify circuits in their mitigation plans that have been frequently de-energized during power shutoffs and to identify the measures, such as moving power lines underground, that the utilities have taken or plan to take to reduce the need for and impact of future power shutoffs. The Legislature could better ensure that utilities are taking adequate steps to reduce the need for power shutoffs by requiring that utilities' mitigation plans also identify the improvements necessary not only to reduce the scope, but to prevent power shutoffs on the circuits routinely affected by them.

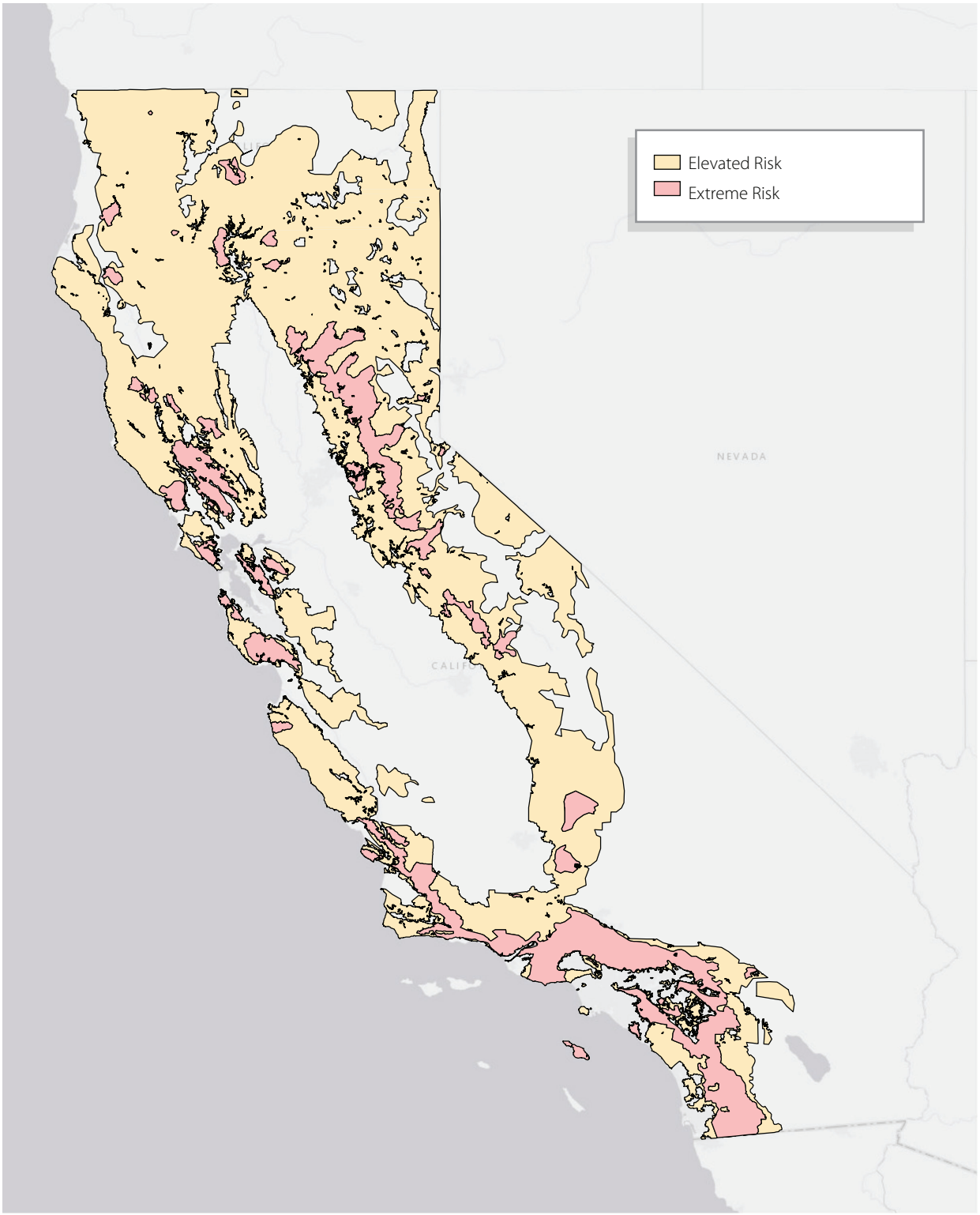
- The three largest utilities have altered settings on their equipment, which resulted in hundreds of unplanned power outages with no advance notice to customers. However, unlike planned power shutoffs, the Energy Safety Office does not currently require utilities to identify in their mitigation plans the power lines that are frequently experiencing these unplanned outages and improvements to reduce their impact.

Implementing Improvements, Such as Installing Covered Power Lines and Managing Vegetation, Can Reduce the Risk of Wildfires and the Need for Power Shutoffs

A 2020 Energy Safety Office report stated that the impact of power shutoffs on safety and climate change goals is intolerable, indicating that it is not a long-term solution to mitigating the risk of wildfires.[3] However, operating portions of the electrical grid in certain weather conditions increases the risk of utility-caused wildfires. In some circumstances, the risk of a catastrophic wildfire in certain areas is so high that utilities determine there is no alternative to turning off the electricity. Thus, all three of the large utilities continue to rely on power shutoffs as a method of last resort to prevent wildfires. According to CPUC data, there were 67 power shutoffs from 2013 through 2021, de-energizing thousands of circuits—sections of power lines within a utility's electrical grid—across California and affecting more than 3.6 million customers. The CPUC publishes a fire threat map that designates significant portions of the State to be at an elevated or extreme risk of fire, as Figure 4 shows, which we refer to collectively as *high fire-threat areas*. The utilities reported information for 57 power shutoffs, and all of them occurred in, or partially in, high fire-threat areas. Those individuals who were affected lost power for 37 hours on average, and some shutoffs involved repeatedly de-energizing the same section of power lines. Further, the CPUC's power shutoff data indicate that from 2017 through 2021, utilities de-energized approximately 270 circuits during three or more different power shutoffs in the same calendar year.

[3] The report stated that utilities' mitigation activities should also advance climate change goals, such as limiting diesel generator usage during power shutoffs.

Figure 4
Large Areas of California Are at Elevated or Extreme Risk of Utility-Caused Wildfires



Source: CPUC's fire-threat map data.

One significant aspect of the electrical grid that contributes to the need for power shutoffs is the number of miles of bare power lines in high fire-threat areas. Nearly 27 percent—more than 74,000 miles of the nearly 277,000 miles of the six utilities' power lines—are located in these areas. The utilities collectively reported that at least 54 percent of these power lines are bare lines, as Table 3 shows. Notably, PG&E accounted for the vast majority of these bare lines—more than 33,000 of the nearly 40,000 miles of bare power lines among utilities in the State. Further, 80 percent of PG&E's power lines in high fire-threat areas are bare.

Table 3
At Least 54 Percent of the Distribution Power Lines in High Fire-Threat Areas Are Bare

	TOTAL MILES IN HIGH FIRE-THREAT AREAS		LINE TYPE							
			BARE		UNDERGROUND		COVERED		OTHER*	
UTILITY	TOTAL MILES	TOTAL PERCENT	MILES	UTILITY PERCENT	MILES	UTILITY PERCENT	MILES	UTILITY PERCENT	MILES	UTILITY PERCENT
PG&E	41,410	56%	33,268	80%	4,996	12%	767	2%	2,379	6%
SCE	23,085	31	5,397	23	10,893	47	None reported		6,795	29
SDG&E	5,953	8	664	11	2,520	42	None reported		2,769	47
Liberty	1,893	3	628	33	525	28	None reported		740	39
PacifiCorp	1,421	2	None reported		486	34	115	8	820	58
Bear Valley	689	1	None reported		124	18	None reported		565	82
Totals	**74,451**		**39,957**	**54%**	**19,544**	**26%**	**882**	**1%**	**14,068**	**19%**

Source: Geographic data for power lines that utilities reported to the Energy Safety Office, as of June 2021, and interviews with Energy Safety Office staff for the categorization of power line status.

Note: This table reflects data submitted to the Energy Safety Office as of June 2021. As we describe in the data reliability section of the report, we determined that these data were of undetermined reliability for our purposes. In addition, utilities have performed additional work on power lines since these data were submitted. Some percentages do not add up to 100 due to rounding.

* This category includes power lines with geographic data that were missing descriptions, as well as power lines that were partially covered or did not fall within any of the other categories.

Bare lines are of particular concern because nearly half of the fire incidents that utilities reported from 2015 through 2020 were caused by power lines coming into contact with foreign objects, including vegetation. The three largest utilities' data on certain ignitions they caused from 2015 through 2020 reveal that power lines themselves accounted for at least 74 percent of ignitions, not including ignitions caused by transformers, fuses, and poles.[4] Figure 5 shows the locations of 3,550 utility-caused ignitions reported by utilities from 2015 through 2020. An SCE study found

[4] A 2014 CPUC decision requires only PG&E, SDG&E, and SCE to collect and report these fire-incident data.

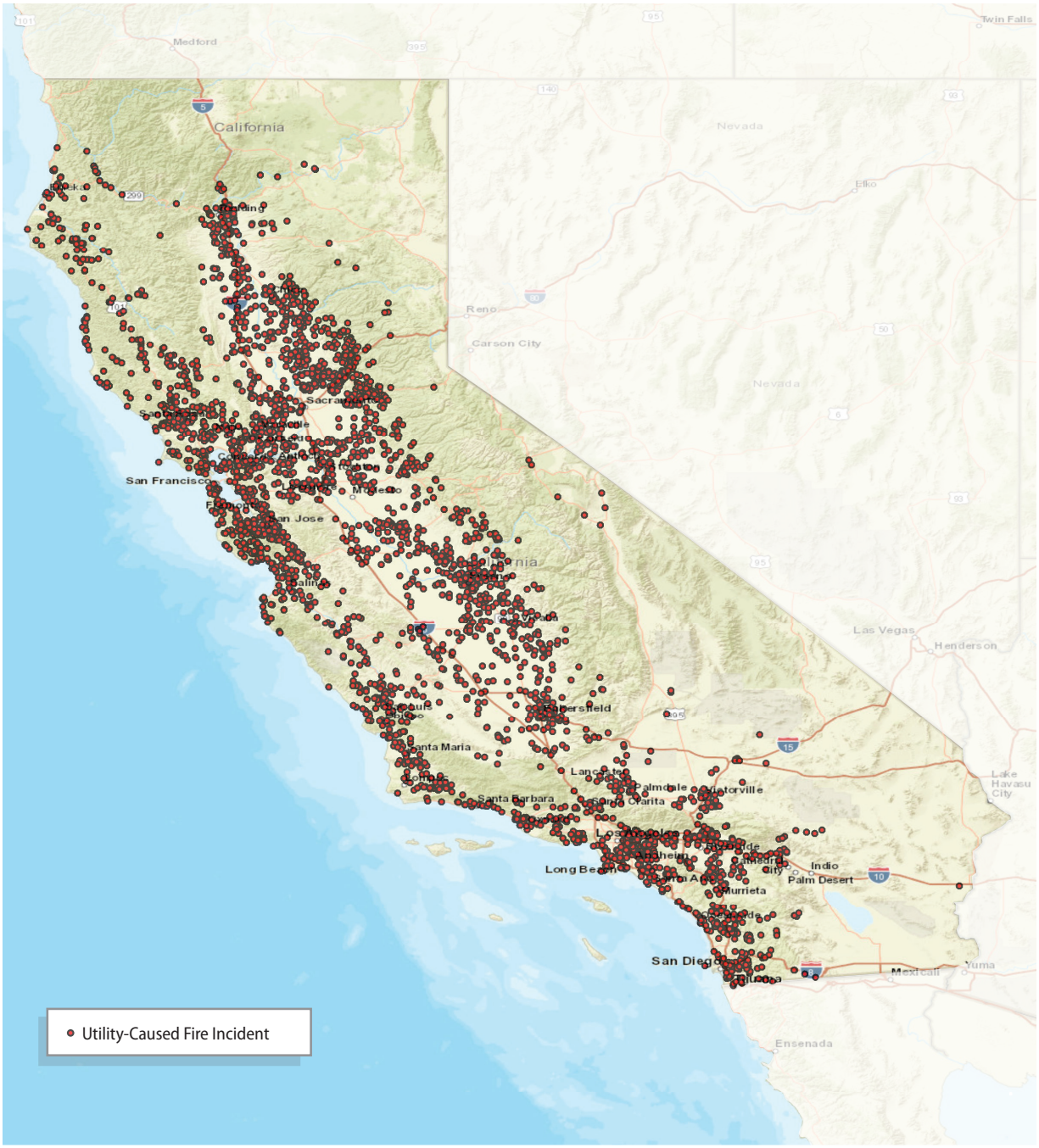
that bare power lines are much less effective than other types of power lines at preventing certain types of faults, or abnormal electrical currents, that can lead to ignitions—such as those caused by vegetation contact, which SCE considers one of the highest risks for causing wildfires.[5] Although only some of the ignitions shown in Figure 5 caused a large wildfire, these are the general types of ignitions that have resulted in catastrophic utility-caused wildfires.

To reduce the risk of utility-caused wildfires and the need for power shutoffs to prevent these types of wildfires, utilities must make improvements to the electrical grid to reduce the likelihood that electrical equipment will cause a fire. For example, at least three of the utilities have altered their power shutoff protocols for areas where they have installed covered power lines to allow for higher wind speeds before resorting to a power shutoff. Installing covered power lines—wires sheathed in a plastic covering that provides an insulating effect—and other mitigation efforts, including burying power lines underground and trimming trees and vegetation from around power lines, have been found to reduce the risk of utility-caused ignitions. According to SCE's 2021 mitigation plan update, making such grid-hardening improvements is one of the most—if not *the* most—important mitigations that SCE can deploy to reduce power shutoffs. However, data that utilities reported to the Energy Safety Office identified that only 27 percent of the power lines in high fire-threat areas are underground or covered. For example, although the land around Arrowhead Lake is in a high fire-threat area, Figure 6 shows that many of its power lines are bare, other, or unknown. Figure 6 also shows a summary by county of the percentage of power lines that five of the utilities reported are underground or covered.

At least three utilities have altered their power shutoff protocols for areas where they have installed covered power lines to allow for higher wind speeds before resorting to a power shutoff.

[5] In 2018 SCE compiled a comprehensive review of the research, benchmarking, engineering analysis, and testing to evaluate the effectiveness of covered lines used in the development of its application for its grid safety and resiliency program.

Figure 5
There Were 3,550 Utility-Caused Fire Incidents Reported by the Three Largest Utilities From 2015 Through 2020



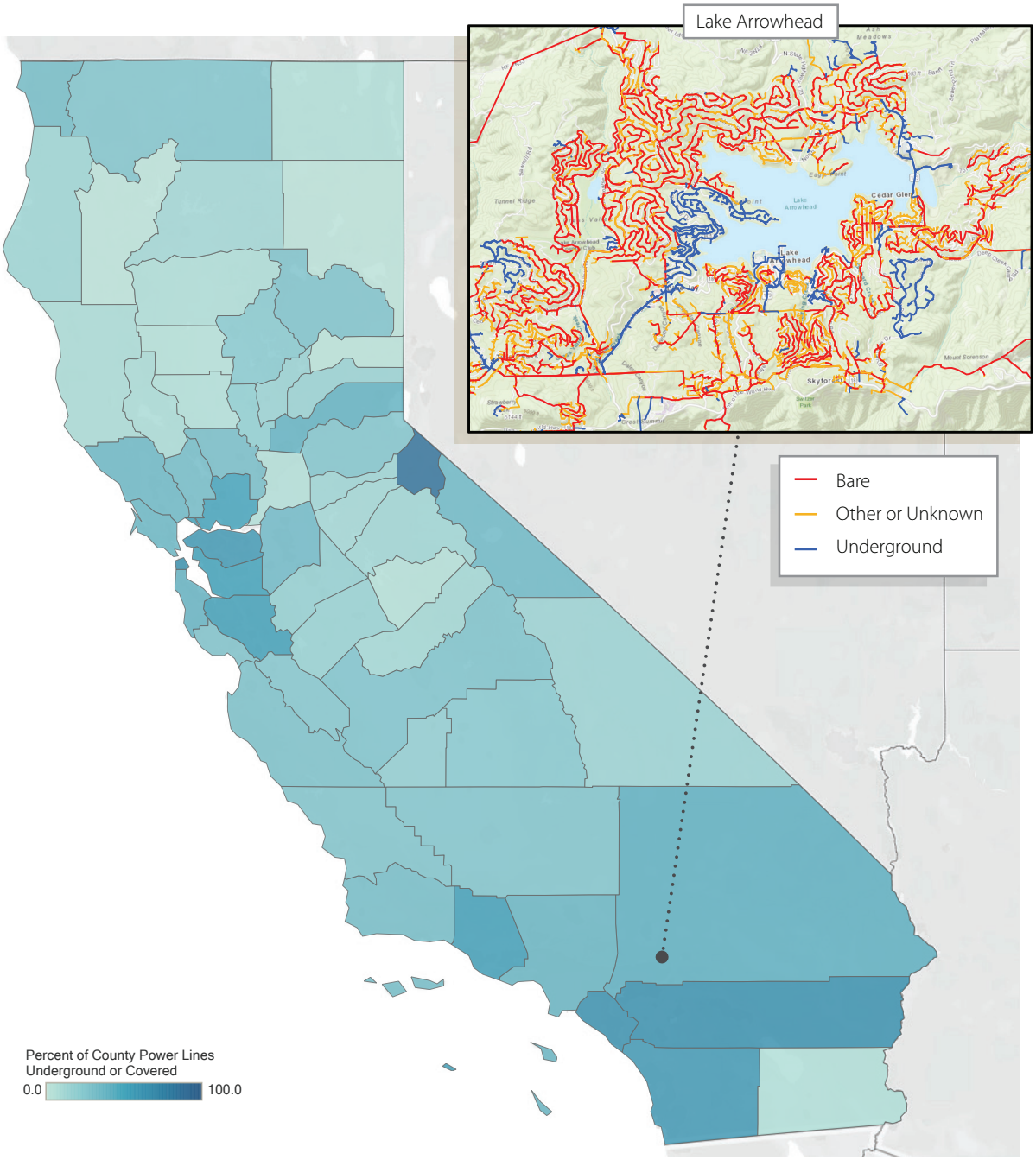
Source: CPUC's utility-reported fire incident data.

Notes: CPUC requires only the three largest utilities—PG&E, SDG&E, and SCE—to report these fire incident data.

We present an interactive dashboard for viewing additional detail about the location, suspected initiating event, and size of the resulting fires at www.auditor.ca.gov/reports/2021-117/supplemental-fire-incident.html

The Camp Fire is not included in this figure. According to the CPUC's wildfire safety enforcement branch program manager, it was not included in PG&E's 2018 ignition report because the investigation of the fire was still open when the data were reported. After we brought this oversight to the CPUC's attention, the program manager stated that CPUC would work with PG&E to obtain amended data for 2018 that includes the Camp Fire.

Figure 6
The Percentage of Utilities' Distribution Lines That Were Underground or Covered as of June 2021 Varied by Location



Source: Geographic data for primary and secondary distribution lines that Bear Valley Electric Service, PacifiCorp, PG&E, SCE, and SDG&E reported to the Energy Safety Office, as of June 2021, and interviews with Energy Safety Office staff.

Notes: We present an interactive dashboard for viewing the status of individual power lines in greater detail at www.auditor.ca.gov/reports/2021-117/supplemental-line-status.html.

Liberty Utilities did not provide consent to publish detailed data.

Trimming and removing trees and other vegetation to maintain a minimum distance from power lines, known as *vegetation management*, is another important strategy that can help reduce the risk of utility-caused wildfires and the need for power shutoffs. Cal Fire's reports on the wildfire incidents it responded to within its direct protection area from 2018 through 2020 indicate that on average, fires caused by vegetation contact accounted for 74 percent of all acres burned by electrical power-caused wildfires.[6] In some instances, high winds blow vegetation into bare power lines, causing sparks that lead to fires. A CPUC General Order requires utilities to keep areas near power lines clear of vegetation, as Figure 7 shows. In some cases, utilities conduct *enhanced vegetation management* exceeding the standard vegetation management requirements. For example, one utility reported that it planned to go beyond the CPUC minimum standards and perform enhanced vegetation management on its distribution lines in elevated and extreme fire-threat districts to the standard shown in the right-hand image in Figure 7. A PG&E analysis of 414 historical ignitions from 2015 through 2017 found that a combination of enhanced vegetation management and system hardening, including installing covered power lines and other improvements, would have mitigated nearly 80 percent of those ignitions. Further, from 2015 through 2020, at least 24 percent of the reportable ignitions the three largest utilities reported were caused by vegetation coming into contact with utility equipment.

According to PG&E, a combination of enhanced vegetation management and system hardening would have mitigated nearly 80 percent of 414 ignitions from 2015 through 2017.

Despite the important benefits that vegetation management provides, at least one utility has failed to perform it sufficiently. According to a November 2021 report on PG&E from the Federal Monitor—an entity originally established by a federal court to prevent the criminal conduct that gave rise to the 2010 San Bruno gas explosion and also assigned the responsibility of assessing PG&E's wildfire mitigation and wildfire safety work—PG&E's routine and enhanced vegetation management work could be improved. For example, PG&E's enhanced vegetation management, which it plans to perform on all circuits in high fire-threat districts, is being performed so slowly that it will take more than 10 years to complete. In 2020 a federal judge found that PG&E had diverted

[6] A *direct protection area* is the area for which a particular fire protection organization has primary responsibility by law or contract for attacking an uncontrolled fire and directing suppression activities.

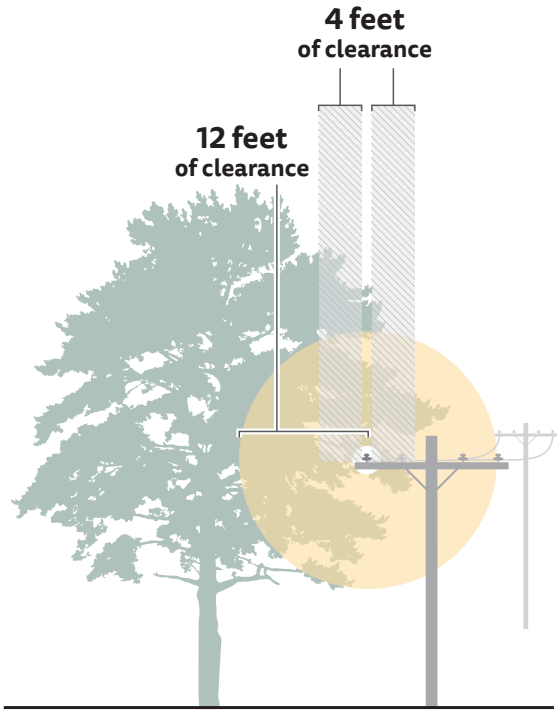
funds from work projects, including vegetation management, for bigger employee bonuses, shareholder dividends, and political contributions, among other things. According to a federal court, the primary cause of wildfires ignited by PG&E were hazardous trees and limbs that should have been, by law, removed. In its September 2020 quarterly report on its mitigation plan, PG&E itself stated that vegetation-caused ignitions are one of the largest drivers of utility-caused wildfires and that vegetation that is not actively managed can come into physical contact with utility equipment year-round, creating additional ignition opportunities.

Figure 7
Vegetation Management Consists of Clearing Vegetation Within a Certain Distance of Power Lines

Required vegetation management

In high fire-threat areas, a CPUC General Order requires utilities to ensure that bare power lines of certain voltages have at least **4 feet of clearance in any direction** from vegetation.

One utility's enhanced vegetation management standard



In this example, the utility has proposed enhanced vegetation management in high fire-threat areas that consists of trimming, at a minimum, any vegetation within **12 feet of the power line**, and overhanging branches and limbs for certain trees **4 feet out from either side of a line and up to the sky**.

Source: CPUC's General Order 95 and PG&E's 2020 Wildfire Mitigation Plan.

Although moving power lines underground is considered one of the best ways to reduce the risk of utility-caused wildfires, that approach is generally expensive to implement. According to the U. S. Energy Information Administration, buried power lines are protected from the wind, ice, and tree damage, so they are subject to fewer weather or vegetation-related outages. However, the U.S. Energy Information Administration also notes that the cost of underground power lines is significant—up to five to 10 times more than overhead distribution lines—and that converting existing overhead power lines to underground lines includes the added cost of dismantling the overhead system. For example, SDG&E and PG&E estimated that moving power lines underground costs approximately $2.6 million and $3 million per mile, respectively. Costs for moving power lines underground also vary by location. A report prepared by the Edison Electric Institute found that the cost of moving power lines underground ranged from $93,000 per mile in rural areas to $5 million per mile in urban areas.

Installing covered power lines is another mitigation activity that can reduce the risk of wildfire and power shutoffs. Figure 8 shows the difference between bare and covered power lines. According to the U.S. Department of Energy and the Institute of Electrical and Electronics Engineers, covered power lines are very effective in preventing potential ignitions resulting from foreign objects that come in contact with traditional bare power lines under high-wind conditions. Moreover, an SCE study found that each dollar spent replacing existing bare power lines with covered lines provided four times as much value in wildfire risk mitigation as a dollar spent on converting the bare lines to underground power lines.

Figure 8
Some Power Lines Are Covered With an Insulating Material to Protect Them From Contact With Other Objects

INSULATION
NO INSULATION
Covered lines have a protective material that insulates the electricity that passes through them.
Bare lines have no insulation.

Source: SCE study.

Despite the risk posed by bare lines, the geographic data and quarterly reports that utilities submitted to the Energy Safety Office indicated that their hardening initiatives have addressed only a relatively small number of the miles of bare power lines in high fire-threat areas. From July 2020 to June 2021, the geographic data the six utilities collectively reported indicate that they completed 628 miles of hardening projects—projects that involve physically manipulating electrical equipment to make it more fire-resistant or to reduce the risk of igniting a fire. The Energy Safety Office's data manager stated that it relies on separate quarterly initiative reports that utilities submit to the Energy Safety Office that summarize their progress in completing the goals enumerated in their mitigation plans. Those reports also show that utilities' hardening projects addressed relatively few miles of the bare power lines in high fire-threat areas. Utilities report on a variety of hardening projects, some of which measure progress by the number of poles inspected or trees removed, rather than in miles of line. However, according to the Energy Safety Office, the 2020 fourth-quarter initiative reports indicate that of the initiatives that are measured in miles, the utilities reported performing hardening on only 1,540 miles of power lines in 2020. Even if all of these hardening projects consisted of replacing bare lines in high fire-threat areas with covered power lines or moving them underground, the utilities would have addressed only 4 percent of the nearly 40,000 miles of bare power lines in areas of elevated or extreme fire risk.

Utilities reported performing hardening on only 1,540 miles of power lines in 2020, and there are nearly 40,000 miles of bare power lines in areas of elevated or extreme fire risk.

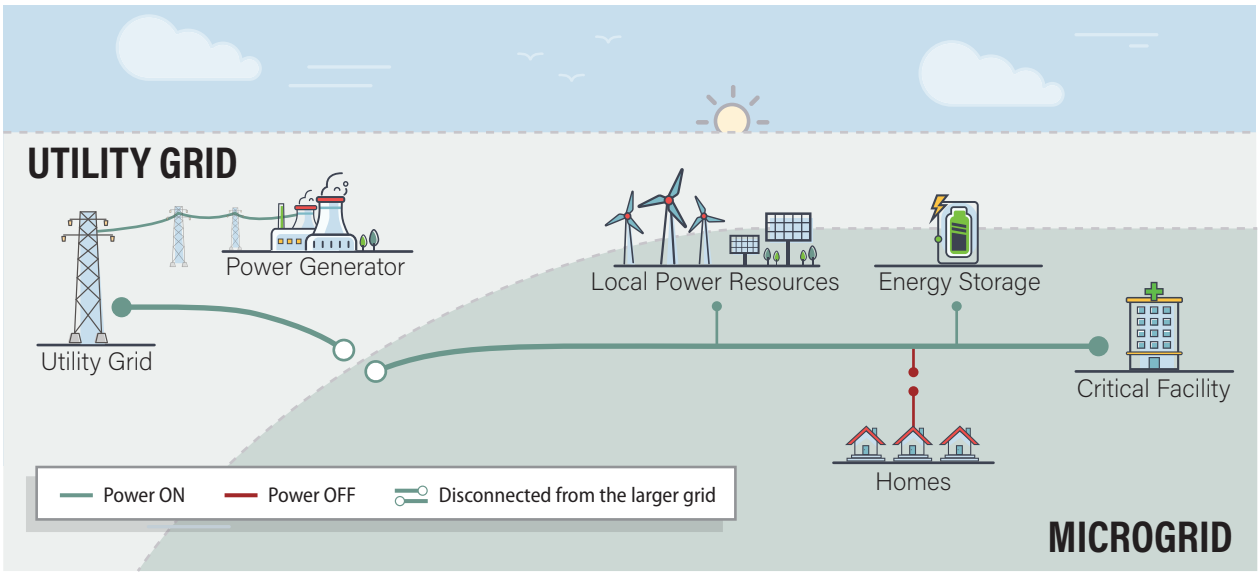
Installing Certain Equipment Can Reduce the Impact of Power Shutoffs but Does Not Fully Prevent Future Shutoffs From Occurring

Effective January 2022, a new state law requires that utilities' mitigation plans identify circuits that have frequently been de-energized and the measures the utilities have taken or plan to take to reduce the need for and impact of future de-energization of those circuits (shutoff reduction law). The shutoff reduction law also requires utilities to estimate their annual decline in circuit de-energization. As part of its 2022 mitigation plan update guidelines, the Energy Safety Office is requiring utilities to include in their plans a list of each circuit that was de-energized to mitigate the risk of wildfires three or more times in a calendar year and the measures

the utility has taken, or plans to take, to reduce the need for and impact of future power shutoffs of that circuit. There are various types of improvements that utilities can make to reduce the scope and impact of power shutoffs, including installing microgrids and sectionalizing devices.

State law defines a *microgrid*, in part, as an interconnected system of sources of energy and energy demands with clearly defined electrical boundaries that can connect to, disconnect from, or run in parallel with, larger portions of the electrical grid. Thus, some microgrids can be disconnected from the electrical grid and operate autonomously to maintain the electrical supply to the critical infrastructure connected to it during power shutoffs. Figure 9 illustrates how a microgrid is able to disconnect from the electrical grid and rely on local power resources and storage to provide electricity for critical services. For example, PG&E installed temporary microgrids that provided electricity for crucial services during at least five power shutoffs in 2020 and 2021. In another instance, a microgrid that received funding through the CPUC's Electric Program Investment Charge (EPIC) program allowed the continued provision of power to approximately 10,000 people in Humboldt County during a 2019 PG&E power shutoff.

Figure 9
Microgrids Can Allow the Continued Provision of Electricity for Critical Services When an Area Is Disconnected From the Larger Electrical Grid



Source: State law, California Energy Commission microgrid project report, and the U.S. Department of Energy's website.

Note: This figure demonstrates some common elements of microgrids. Microgrids come in a variety of designs and sizes, and they can be set up for operation in various ways and for different purposes.

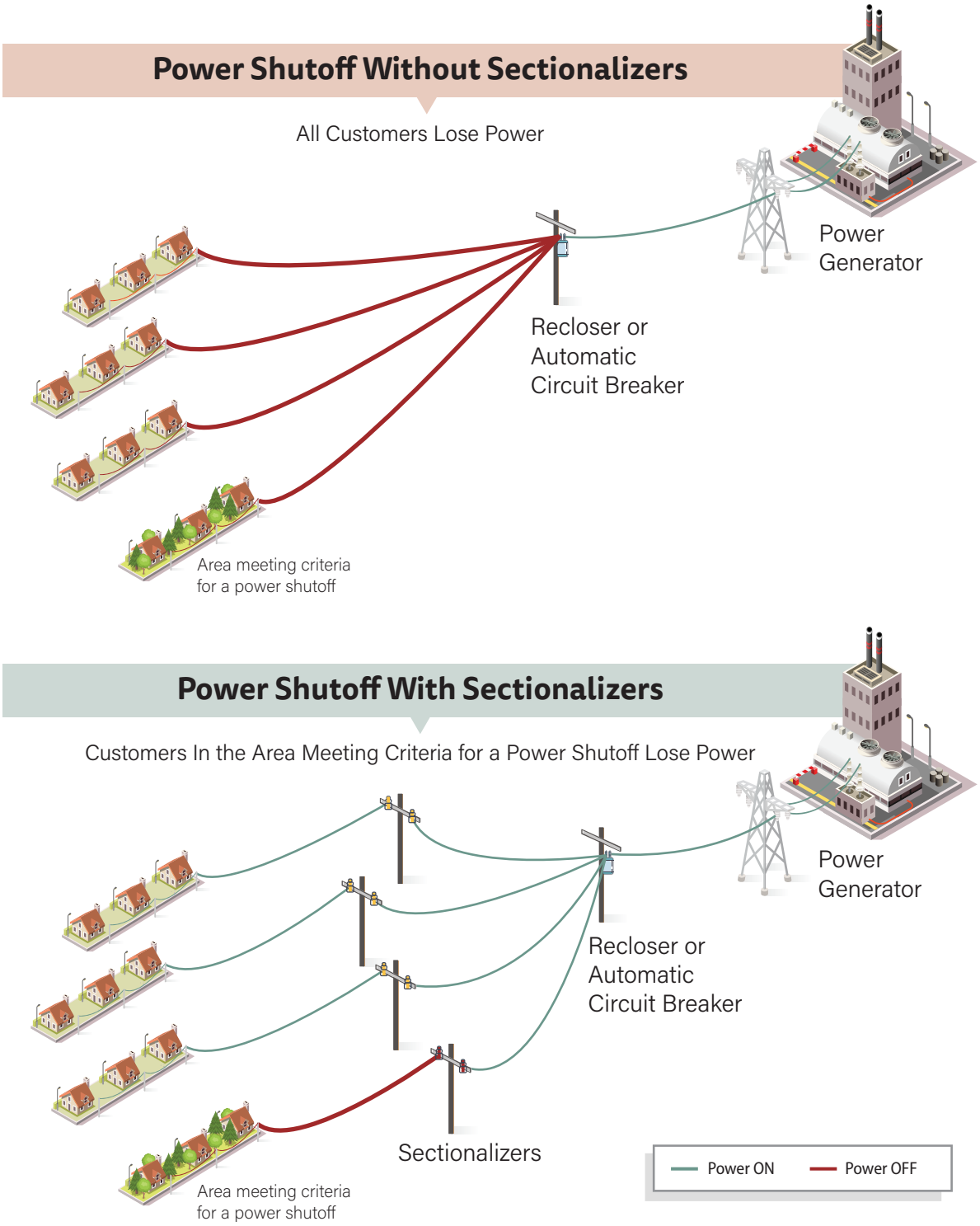
The CPUC established the EPIC program in December 2011 to fund public investments in microgrids and other technologies, tools, and strategies that benefit electricity ratepayers. Reports on EPIC-funded microgrids published by the California Energy Commission, which helps administer the program, indicate that they reduced the scope and impact of electric outages and resulted in economic benefits. According to the CPUC, the EPIC program has funded at least 23 microgrid-related projects since 2015. The cost of installing microgrids can vary. For example, EPIC-funded microgrid projects ranged in cost from $1.2 million to more than $9 million.

Sectionalizing devices can also limit the scope of a power shutoff event. For the purpose of this report, we define *sectionalizing devices* as equipment that allows utilities to turn off power to smaller segments of the electrical grid and reduce the impact of a de-energization event. Figure 10 shows how sectionalizing devices, in conjunction with reclosers or automatic circuit breakers, can help reduce the number of customers affected by a power shutoff event by limiting its extent. Reclosers and circuit breakers are types of equipment that allow utilities to interrupt power at the point they are located within a circuit. The three largest utilities installed approximately 1,000 sectionalizing devices from 2019 through 2020, and they rely on these devices to reduce the extent of power shutoffs and to help minimize the number of customers impacted by them. Both PG&E and SDG&E also indicated that they plan to install additional sectionalizing devices by the end of 2022.

Although microgrids and sectionalizing devices can reduce the impact of power shutoffs and the number of customers affected, they do not fully eliminate the need for future power shutoffs if weather conditions occur that are similar to those that triggered the earlier power shutoffs. To prevent the need for power shutoffs, utilities must make improvements, such as installing covered power lines or moving them underground to increase power lines' resilience in high-wind conditions and reduce the likelihood of the power lines igniting a wildfire.

Although microgrids and sectionalizing devices can reduce the impact of power shutoffs and the number of customers affected, they do not fully eliminate the need for future power shutoffs.

Figure 10
Sectionalizers Allow Utilities to Turn Off Smaller Portions of the Grid, Which Can Reduce the Scope and Impact of Power Shutoffs


Power Shutoff Without Sectionalizers
All Customers Lose Power
Power Generator
Recloser or Automatic Circuit Breaker
Area meeting criteria for a power shutoff
Power Shutoff With Sectionalizers
Customers In the Area Meeting Criteria for a Power Shutoff Lose Power
Power Generator
Recloser or Automatic Circuit Breaker
Sectionalizers
Area meeting criteria for a power shutoff
Power ON
Power OFF

Source: The CPUC.

The Legislature Should Strengthen the Shutoff Reduction Law to Require That Utilities Identify Measures Necessary to Prevent Power Shutoffs

The cost of making the improvements necessary to prevent power shutoffs throughout the State, such as installing covered power lines or moving lines underground, is generally significant and could pose a burden to ratepayers. Although utilities report that installing covered lines is generally cheaper than placing them underground, it may well cost billions of dollars to address bare power lines in high fire-threat areas. Based on the amounts the three largest utilities reported spending to install covered power lines in 2020, it cost about $700,000 per line mile on average. Using this figure, the cost of replacing the nearly 40,000 miles of bare lines utilities reported in areas of elevated and extreme fire risk would be $28 billion. The CPUC's Public Advocates Office and other stakeholders have raised concerns about the cost-effectiveness of installing covered power lines when utilities have proposed such programs because portions of certain utility proposals were not located in the highest-risk portions of the electrical grid. For example, The Utility Reform Network—a nonprofit consumer advocacy organization—argued in 2019 that SCE's general rate case for 2021, 2022, and 2023 was unaffordable and recommended that SCE focus on its highest-risk segments and reduce its budget for installing covered power lines from $2.7 billion to $643 million.

It may well cost billions of dollars for utilities to address bare power lines in high fire-threat areas.

Although the shutoff reduction law requires utilities to identify circuits that have been routinely de-energized to mitigate the risk of wildfires, the law could be strengthened by requiring that utilities identify specific improvements that are necessary to prevent future power shutoffs. To implement the shutoff reduction law, the Energy Safety Office requires utilities' 2022 mitigation plans to map and list frequently de-energized circuits and list the measures they have taken or will take to reduce the need for and impact of future de-energization of those circuits. Its director stated that the Energy Safety Office will determine what next steps are necessary after it evaluates how well utilities plan to reduce the scope and frequency of the power shutoffs described in their 2022 mitigation plans.

Although such planned reductions in the scope and frequency of power shutoffs may represent an improvement, any power shutoff generally imposes risks and hardships. Further, if the Energy Safety Office is to minimize the need to use power shutoffs as a wildfire mitigation tool and meet its stated objective of pursuing wildfire mitigation activities that do not significantly impact electric utility reliability, it will need to ensure that utilities make improvements to the electrical grid that eliminate the need for power shutoffs in the weather conditions that have led to their routine use in the past. The Legislature could better ensure that utilities are taking adequate steps to reduce the need for power shutoffs by requiring that utilities' mitigation plans also identify the improvements necessary not only to reduce the scope, but also to prevent power shutoffs on the circuits routinely affected by them if the conditions leading to those shutoffs were to occur again.

The number and cost of improvements utilities will need to make is not known, in part because the shutoff reduction law took effect in January 2022. Further, the shutoff reduction law does not require utilities to estimate the cost of future improvements to circuits that are frequently de-energized. The significant cost of making improvements necessary to prevent the need for power shutoffs, such as installing covered power lines or moving them underground, may be one of the reasons why the improvements have not yet been made. However, even if these improvements cost billions of dollars, SCE's estimates of customers' costs during power shutoffs indicate that power shutoffs have cost more than $21 billion to date, as discussed earlier.

Utilities' Alteration of Power-Line Settings Have Resulted in Hundreds of Unplanned Power Outages, Affecting More Than a Half Million Customers

The three largest utilities have altered settings on their equipment, including circuit breakers and reclosers, resulting in unplanned power outages (unplanned outages) throughout the State. When there is excessive current flowing in a circuit—which could be caused by an object like a tree blown over in high winds making contact with an energized line—a circuit breaker or recloser automatically interrupts power to the circuit. Typically, after a preset duration, a recloser restores the power to determine whether the fault still exists and interrupts power again if it does. The recloser repeats this sequence a set number of times, and if it continues to detect the fault, it will de-energize the line. However, utilities are able to change settings on some breakers and reclosers so that they turn off the power more quickly if there is an issue on an energized line. PG&E stated that adjusting these settings in 2021

to turn electricity off more quickly resulted in an approximate 46 percent reduction in ignitions in high fire-threat areas compared to the three-year historical average.

Although those actions may have effectively prevented wildfires, PG&E's alteration of breaker and recloser settings in 2021, known as *enhanced powerline safety settings* (power-line settings program), also triggered hundreds of unplanned outages that affected more than a half million customers. PG&E stated that in July 2021, it altered these settings along 11,500 miles of power lines located in high fire-threat areas. From late July through early November 2021, its power-line settings program resulted in nearly 600 unplanned outages that affected more than 650,000 customers. These outages occurred with no advance notice, affected an average of more than 1,000 customers per outage, and averaged more than 17.5 hours per customer in duration. The CPUC indicates these outages are more than a matter of inconvenience—they are disruptive, and for customers who rely on electricity to maintain necessary life functions, they can be life-threatening. However, unlike a planned shutoff, customers and public safety partners receive no warning of these outages before their power is interrupted.

Unlike a planned shutoff, customers and public safety partners receive no warning of these outages before their power is interrupted.

According to the CPUC's website, all six utilities will include altering settings on their equipment (power-line setting measures) in their 2022 mitigation plans, and both PG&E and SDG&E have already indicated that they plan to use these settings in the future, resulting in more unplanned outages. Although some utilities reported reductions in the extent and duration of proactive power shutoffs in 2020 and anticipated further reductions in 2021, this decrease may be related to the additional use of power-line setting measures that more frequently trigger unplanned outages for customers. For instance, although PG&E expects to see further reductions in the scope of proactive power shutoffs, according to the CPUC's wildfire safety enforcement branch program manager, PG&E indicated to the CPUC that it anticipates expanding the power-line settings program in 2022.

Despite the hundreds of unplanned outages and more than a half million customers affected by PG&E's use of the power-line settings program in 2021, the Energy Safety Office does not consider power-line settings programs to fall under the definition of a de-energization event as described in the shutoff reduction law. Thus, the office does not require utilities' mitigation plans to identify the circuits that are frequently experiencing these unplanned outages or the measures the utilities have taken or plan to take to reduce the need for and impact of unplanned outages in the future. The Energy Safety Office's director indicated that the office may issue guidelines regarding utilities' use of the program in the future. However, the unplanned outages due to the power-line settings program that are caused by power lines contacting vegetation are the result of the same situations that power shutoffs are intended to prevent. Until utilities make improvements to those power lines that are routinely de-energized because they have altered settings on their equipment, it is likely that customers will continue to be subject to additional unplanned outages in coming years.

Until utilities make improvements to power lines that are routinely de-energized because they have altered settings on their equipment, it is likely that customers will continue to be subject to additional unplanned outages in coming years.

Recommendations

To prevent power shutoffs rather than only reducing their scope and impact, the Legislature should amend the shutoff reduction law to require that utilities describe in their mitigation plans the improvements that would be necessary to prevent power shutoffs on the circuits routinely affected by them—such as installing covered power lines—and the costs of those improvements.

To address the risks and hazards resulting from future unplanned outages, the Legislature should amend the shutoff reduction law to include circuits frequently de-energized as the result of utilities' power-line setting measures. In doing so, the Legislature will create a requirement that utilities identify in their mitigation plans

the circuits frequently de-energized as a result of their power-line setting measures and the improvements they have made or plan to make to those circuits.

The Energy Safety Office Awarded Safety Certifications to Utilities Despite Serious Deficiencies in Their Mitigation Plans

Key Points:

- The Energy Safety Office issued safety certifications even though it identified deficiencies in utilities' mitigation plans.
- Further, state law does not require the Energy Safety Office to ensure that utilities have implemented prior mitigation plans before they are issued safety certifications.

Our review of the 2020 safety certifications issued to PG&E, SCE, and SDG&E found weaknesses in the Energy Safety Office's process for issuing them.[7] As we discuss in the Introduction, the office must issue safety certifications to utilities that demonstrate they meet certain criteria established in statute. Having an approved mitigation plan—which identifies the activities the utility intends to undertake to mitigate wildfire risks—is one of these legal requirements. However, the office identified significant deficiencies in the 2020 mitigation plans that PG&E, SCE, and SDG&E submitted. Specifically, it determined that each utility's plan had one or more *Class A deficiencies*—the most serious type of deficiency—which it describes as an aspect of the mitigation plan that is lacking or flawed. For example, the office determined that all three plans failed to demonstrate how they were using risk modeling to inform decision making, and thus they could not demonstrate that they were targeting the highest-risk portions of the electrical grid. Nonetheless, the Energy Safety Office issued a *conditional approval* of the mitigation plans for all three of these utilities we reviewed. Conditional approval is a term not defined in the statute pertaining to mitigation plans, yet as we describe below, the office treated it as an approval. As a part of the conditional approval, the office required utilities to file remedial plans to resolve the deficiencies it had identified. However, the office found that all of the three utilities' remedial plans were insufficient.

Although the Energy Safety Office identified significant concerns with each of the three large utilities' 2020 mitigation plans, it approved the plans through its conditional approval process and issued safety certifications to the utilities. The director of the office stated that for the 2020 mitigation plans approved while she was director of the Wildfire Safety Division, a conditional approval constituted approval pursuant to state law, and that although the utilities were required to submit remedial plans, its analysis of these plans was not a condition of its approval. As we discuss later, the office revised its mitigation plan review process for 2021 mitigation plans and now requires utilities to address critical issues before it approves their plans. However, the office's own definition

[7] As we discuss in the Introduction, we use the term Energy Safety Office to refer to either the CPUC's Wildfire Safety Division or the Office of Energy Infrastructure Safety depending on when actions occurred. The Legislature transferred all the functions of the Wildfire Safety Division to the Office of Energy Infrastructure Safety effective July 1, 2021. Thus, the actions we describe in the text that occurred prior to July 1, 2021, were taken by the Wildfire Safety Division and any actions that occurred after were taken by the Office of Energy Infrastructure Safety.

of the deficiencies it identified as mitigation plan aspects that are lacking or flawed, and its revision of its approval process, calls into question the appropriateness of the process it followed to approve mitigation plans and issue safety certifications for 2020.

Even if the Energy Safety Office's process for issuing safety certifications had not included conditional approvals, the requirements in state law are insufficient to assure that utilities that are issued certifications have implemented their mitigation plans. The bill establishing the requirements for safety certifications describes how the Wildfire Fund will support the credit worthiness of electrical corporations. It also describes how utilities must invest in hardening electrical infrastructure and performing vegetation management, and that a safety certification encourages utilities to invest in safety and improve safety culture to limit wildfire risks. However, the state law does not allow the Energy Safety Office to deny a safety certification on the basis that a utility did not implement a prior mitigation plan.

The Energy Safety Office must issue a safety certification if a utility demonstrates that it:

1. Has an approved mitigation plan.
2. Is in good standing, and has agreed to implement the findings of its most recent safety culture assessment, if applicable.
3. Has established a safety committee of its board of directors, composed of members with relevant safety experience.
4. Has an approved executive incentive compensation structure that promotes safety as a priority.
5. Has established board-of-director-level reporting on safety issues to the CPUC and the Energy Safety Office.
6. Has established a compensation structure for executive officers that is based on principles, including limits on guaranteed cash compensation, no guaranteed monetary incentives, and incentives for performance, including safety performance.
7. Is implementing its most recently approved mitigation plan and submits quarterly information detailing implementation of the plan and safety culture assessment recommendations.

Source: State law.

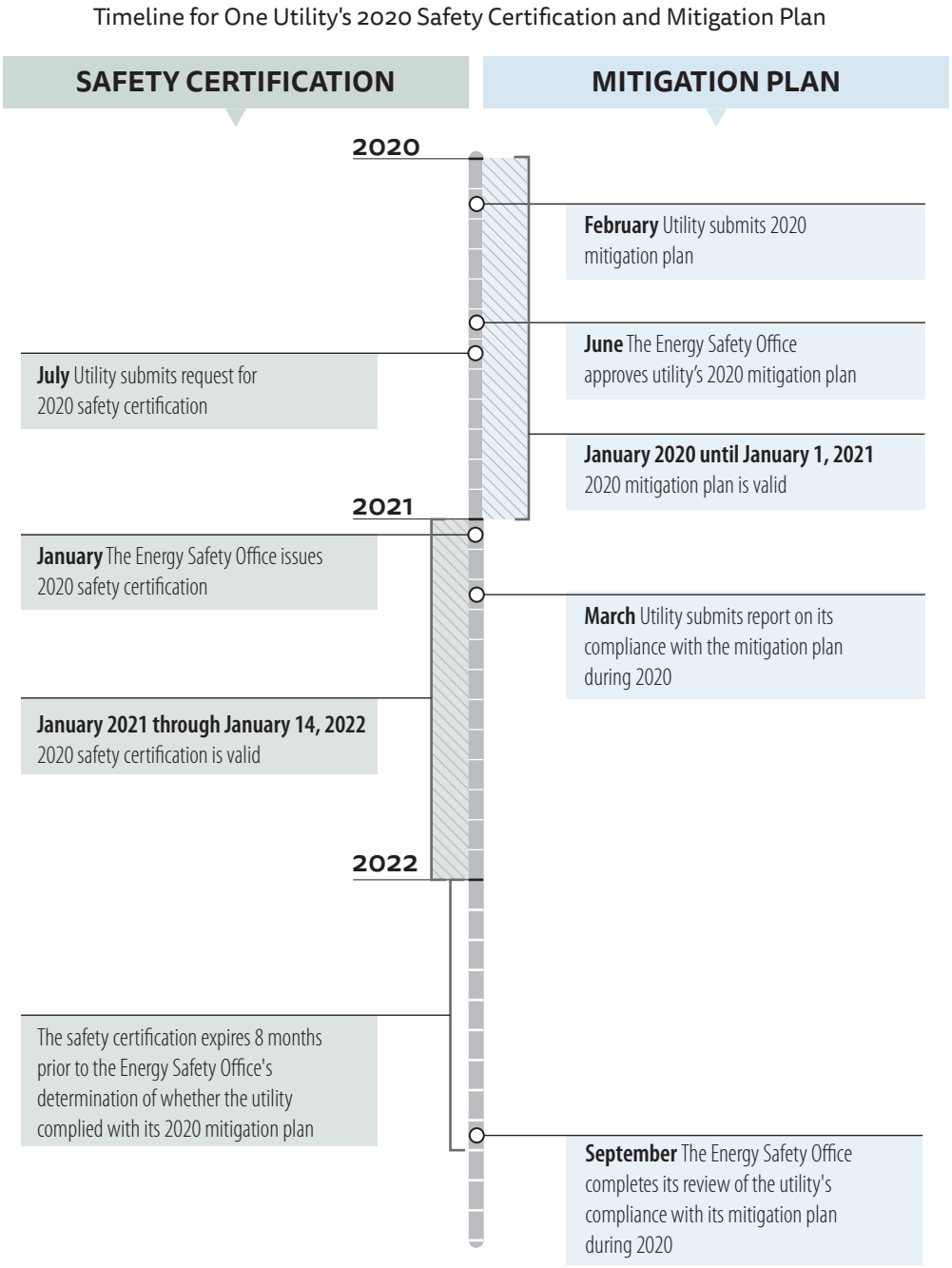
As the text box shows, state law requires that the Energy Safety Office issue a safety certification to a utility that meets a number of requirements, including demonstrating that it is implementing its approved mitigation plan and submitting quarterly notifications about implementation. State law does not include the utility's implementation of a prior year's plan as criteria for issuance of the safety certification. It does require the office to issue a safety certification if a utility is implementing its most recently approved mitigation plan, among other things. However, the implementation of the plan is occurring in the same time frame as the safety certification determination. The Energy Safety Office's director stated that the compliance period for a mitigation plan is defined as the calendar year in which the plan was filed, and a utility must be afforded the full compliance period to determine whether it has substantially implemented its plan. Because the rate at which a utility completes initiatives varies throughout the year, the director also stated that the Energy Safety Office does not expect a utility to accomplish an equal 25 percent in each quarter of the work it plans to complete.

Further, the Energy Safety Office's final assessment of whether a utility has implemented its mitigation plan does not occur until well after the safety certificate expires. As the example in Figure 11 shows, the office is not required to make a determination of whether the utility complied with its mitigation plan during calendar year 2020 until September 2022—more than eight months after the end of the period for which the 2020 safety certification was valid. Therefore, whether a utility substantially implements the projects in its mitigation plan has no bearing on the issuance of its safety certification as a result of these two factors: first, because the implementation of the plan is in progress, the Energy Safety Office performs only a limited review of whether a utility is implementing its current mitigation plan, and second, determinations of whether a utility substantially implemented its prior mitigation plans are not one of the criteria established in law for it to assess when issuing a safety certification.

Whether a utility substantially implements the projects in its mitigation plan has no bearing on the issuance of its safety certification.

The Energy Safety Office's inability to deny a safety certification based on poor implementation of prior mitigation plans led it to issue a safety certification to PG&E despite concerns about PG&E's progress in mitigating wildfire risks. In October 2020, before the office issued PG&E's 2020 safety certification, the Federal Monitor concluded that it strongly appeared that PG&E had failed to adhere to its risk models when executing its wildfire risk reduction work. Specifically, the Federal Monitor noted that PG&E had completed the majority of its 2019 enhanced vegetation work in relatively low-risk portions of its high fire-threat areas, and it had performed approximately 1,000 inspections of transmission towers outside of high-threat areas, but it had not conducted any of its planned enhanced inspections of transmission structures in its highest-threat areas. The office noted these concerns in the issuance letter for PG&E's safety certification but nonetheless stated that PG&E had met the minimum statutory requirements for issuance of a safety certification.

Figure 11
Energy Safety Does Not Determine Whether a Utility Has Implemented Its Mitigation Plan Until After Issuing Its Safety Certification


Timeline for One Utility's 2020 Safety Certification and Mitigation Plan
SAFETY CERTIFICATION
MITIGATION PLAN
2020
February Utility submits 2020 mitigation plan
June The Energy Safety Office approves utility's 2020 mitigation plan
July Utility submits request for 2020 safety certification
January 2020 until January 1, 2021
2020 mitigation plan is valid
2021
January The Energy Safety Office issues 2020 safety certification
March Utility submits report on its compliance with the mitigation plan during 2020
January 2021 through January 14, 2022
2020 safety certification is valid
2022
The safety certification expires 8 months prior to the Energy Safety Office's determination of whether the utility complied with its 2020 mitigation plan
September The Energy Safety Office completes its review of the utility's compliance with its mitigation plan during 2020

Source: State law and safety certification and mitigation plan documents.
Note: Dates for other utilities varied.

Although the office's director stated that if the law were amended to require that the office consider completed compliance assessments of previous mitigation plans, it could incorporate the assessments into the process, she nonetheless expressed concern that it would change the statutory intent of the safety certification. Specifically, she noted that the certification is currently designed to encourage utilities to invest in safety and improve their safety cultures to limit wildfire risks and reduce costs, but it was not designed to be retrospective or punitive. Although we agree that the law establishing the Wildfire Fund describes the intent of the safety certification in this manner and that its focus is directed to utilities that are safe actors, it is unclear how issuing safety certifications to utilities that fail to implement their mitigation plans furthers this intent.

Recommendation

To ensure that safety certifications encourage utilities to invest in safety and limit wildfire risks, the Legislature should require that as a prerequisite of issuing a safety certification, the Energy Safety Office's most recently completed compliance assessment of a utility's mitigation plan must conclude that the utility has substantially implemented that plan.

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The Energy Safety Office's Mitigation Plan Approval Process and the CPUC's Audit Process Do Not Hold Utilities Sufficiently Accountable

Key Points:

- The Energy Safety Office approved mitigation plans despite identifying deficiencies in how utilities planned to prioritize mitigation activities. Subsequent external reviews established that these planning deficiencies were followed by a lack of mitigation efforts in areas of highest risk of wildfire.
- To better hold utilities accountable for the initiatives identified in their past mitigation plans, the Energy Safety Office needs to require utilities to systematically address the findings of external reviews in their plans.
- The CPUC conducts audits to determine whether utilities are in compliance with rules designed to ensure that they are operating safely, but those audits could be improved to better ensure utilities' compliance and consequently help mitigate the risk of utility-caused wildfires. Specifically, the CPUC does not consistently audit all areas in the utilities' service territories, did not audit several areas that were designated as being in high fire-threat areas, and does not use its authority to penalize utilities when its audits uncover violations.

The Energy Safety Office Has Failed to Ensure That Utilities Focus Mitigation Activities in the Areas of Highest Fire Risk

The Energy Safety Office has approved some utilities' mitigation plans even though the utilities' failed to demonstrate that they are appropriately prioritizing their mitigation activities. As we discuss earlier, utilities' reports submitted to the office indicated that their hardening initiatives have addressed a relatively small number of the miles of bare power lines in high fire-threat areas. However, we found that the office approved mitigation plans that did not provide adequate information on how utilities prioritized those initiatives. State law requires utilities to submit mitigation plans to the office for review and approval. According to the Energy Safety Office's director, the office's approach to reviewing mitigation plans is focused on evaluating the utilities' processes for considering risks, such as ignition risk from equipment failure or vegetation contact, when making their decisions.[8] Despite this focus, the office approved utilities' 2020 and 2021 mitigation plans even though the utilities had not provided sufficient information on how they used risk modeling outcomes to inform decision-making processes, circuit prioritization for mitigation efforts, and mitigation selection. Moreover, the Energy Safety Office acknowledged the absence of this information in its summary of changes for the 2022 mitigation plan update guidelines. As described below, external reviews and the

[8] According to the 2021 mitigation plan guidelines template, a risk-informed decision-making process incorporates an assessment of the overall ignition probability, estimated wildfire consequence for specific electric lines and equipment, and estimation of wildfire and power shutoffs' risk-reduction impact, among other factors.

office's own audits confirmed the significance of this deficiency, as these reviews and audits established that PG&E did not focus its mitigation activities on the highest risk areas.

For example, the Energy Safety Office conditionally approved PG&E's 2020 mitigation plan in June 2020 even though it found that PG&E did not describe in sufficient detail where vegetation management was most necessary or how it prioritized deployment of vegetation management initiatives in its plan. In subsequent months, this weakness in PG&E's vegetation management efforts was confirmed and highlighted by external reviews and audits. As discussed previously, the Federal Monitor noted in October 2020 that PG&E had completed the majority of its 2019 enhanced vegetation work in relatively low-risk portions of its high fire-threat areas and had not conducted any of its planned enhanced inspections of transmission structures in its highest threat areas. Moreover, the Energy Safety Office published an audit in February 2021, which found that during 2020, PG&E continued to conduct enhanced vegetation management primarily in areas of lower fire risk. The audit concluded that PG&E's 2020 vegetation management program appears not to have sufficiently prioritized or reduced the risk of wildfires.

The Energy Safety Office's audit concluded that PG&E's 2020 vegetation management program appears not to have sufficiently prioritized or reduced the risk of wildfires.

In its review of PG&E's 2021 mitigation plan, the Energy Safety Office determined that PG&E made progress in updating its vegetation risk model in a way that PG&E claimed would allow it to prioritize work in greater detail. However, the office's review found that the utility failed to demonstrate that it was properly prioritizing other mitigation activities, particularly power line replacement and system hardening efforts. Despite these and other concerns, the office approved PG&E's 2021 mitigation plan in September 2021. Once again, a subsequent external review confirmed the extent of the problem with PG&E's inadequate prioritization of mitigation activities. In its 2021 mitigation plan, PG&E committed to conducting 180 miles of system hardening in 2021, 80 percent (or 144 miles) of which would be in high wildfire risk areas, in fire rebuild areas, or in power shutoff mitigation areas. The Federal Monitor published a report in November 2021 indicating that up to that point PG&E had hardened 168 total miles but only 36.5 (22 percent) of these miles were in high wildfire risk areas. The Energy Safety Office

identified similar problems with other utilities' mitigation plans that it approved. For example, it approved SDG&E's 2021 mitigation plan despite noting that the utility did not provide sufficient detail on how it prioritized high fire-threat areas for mitigation activities, such as moving power lines underground and installing covered power lines.

In its guidelines for utilities' preparation of their 2022 mitigation plans, the Energy Safety Office attempted to address the problems described above by requiring utilities to detail how their risk models will be used to inform how they prioritize mitigation activities. However, the office's internal procedures for reviewing mitigation plans still contain a fundamental flaw that needs to be addressed. These procedures indicate that certain deficiencies in a utility's mitigation plan should not prevent the office's approval of a mitigation plan and that the office may allow the utility to address these deficiencies in a subsequent mitigation plan. In contrast, other deficiencies—known as *critical issues*—are major concerns and must be addressed before the office can consider the plan for approval. The procedures provide examples of both critical issues and deficiencies. However, an example in the procedures that states, "Utility provides little discussion in how it uses the results of its risk scoring to determine grid hardening," is classified as a deficiency that can be addressed in a subsequent year's mitigation plan. This procedure and accompanying example as stated enable the Energy Safety Office to continue to approve mitigation plans that do not clearly define where mitigation activities will occur. By not characterizing this example as a *critical issue*, the office does not hold utilities accountable for conducting these activities in areas of highest risk for wildfire.

The Energy Safety Office's internal procedures for reviewing mitigation plans still contain a fundamental flaw that needs to be addressed.

Current Mitigation Plans Do Not Incorporate the Results of External Reviews

The Energy Safety Office has not required that utilities address in their mitigation plans the issues identified by oversight mechanisms—such as audits and external reviews of their mitigation activities—resulting in plans that are not responsive to previously identified deficiencies. As discussed earlier, the Federal Monitor reported deficiencies with PG&E's vegetation work and also reported that as of August 2020, PG&E had failed to conduct any of the enhanced inspections of approximately 1,000 transmission structures in high fire-threat areas

as planned for in its 2020 inspections. We reviewed PG&E's 2021 mitigation plan submitted in February 2021 and found that the utility referenced how it would address the Federal Monitor's finding on its vegetation management program, but it did not address the Federal Monitor's finding relating to its lack of enhanced inspections. Although PG&E's 2021 mitigation plan indicated that it intended to complete enhanced inspections of transmission structures, the Federal Monitor reported in November 2021 that PG&E had not in any previous year met the inspection commitments in its mitigation plans. Requiring PG&E and other utilities to specifically address these types of findings from external reviews would help the Energy Safety Office better hold utilities accountable for achieving year-over-year progress.

Requiring utilities to specifically address findings from external reviews would help the Energy Safety Office better hold utilities accountable for achieving year-over-year progress.

The Energy Safety Office's director expressed concern that there is no definitive source for all the oversight mechanisms to which the utilities are subject. She also stated that she believed tracking and including issues identified by oversight mechanisms in their mitigation plans must be the responsibility of the utilities. However, if utilities are to bear the responsibility for tracking the issues identified by external reviews, the office needs to update its mitigation plan guidelines to establish that requirement. By doing so, the office can define the types of oversight entities, mechanisms, and issues that need to be included in the mitigation plan and also take steps to verify the information utilities include.

The CPUC's Audits Could Be Improved to Ensure That Utilities Are Performing Critical Wildfire Mitigation Efforts in High Fire-Threat Areas

The CPUC's audits play an important role in ensuring that utilities safely operate the electrical grid, but they could be improved to better ensure utilities' compliance and help mitigate the risk of utility-caused wildfires. The CPUC's mission is to, among other things, assure that utility services are safe. According to the program manager for the CPUC's Electric Safety and Reliability Branch (safety and reliability program manager), in addition to conducting incident investigations and reviewing reports the utilities provide, the CPUC uses audits to

determine whether utilities are in compliance with the rules designed to ensure that they are safely operating the electrical grid.[9] These audits determine whether utilities are following the construction, maintenance, and inspection requirements outlined in various General Orders. For example, some of these General Orders require utilities to replace electrical equipment that may be at risk of failing, to perform inspections of their electrical equipment, and to conduct vegetation management around power lines. However, there are problems with key aspects of the CPUC's audit process.

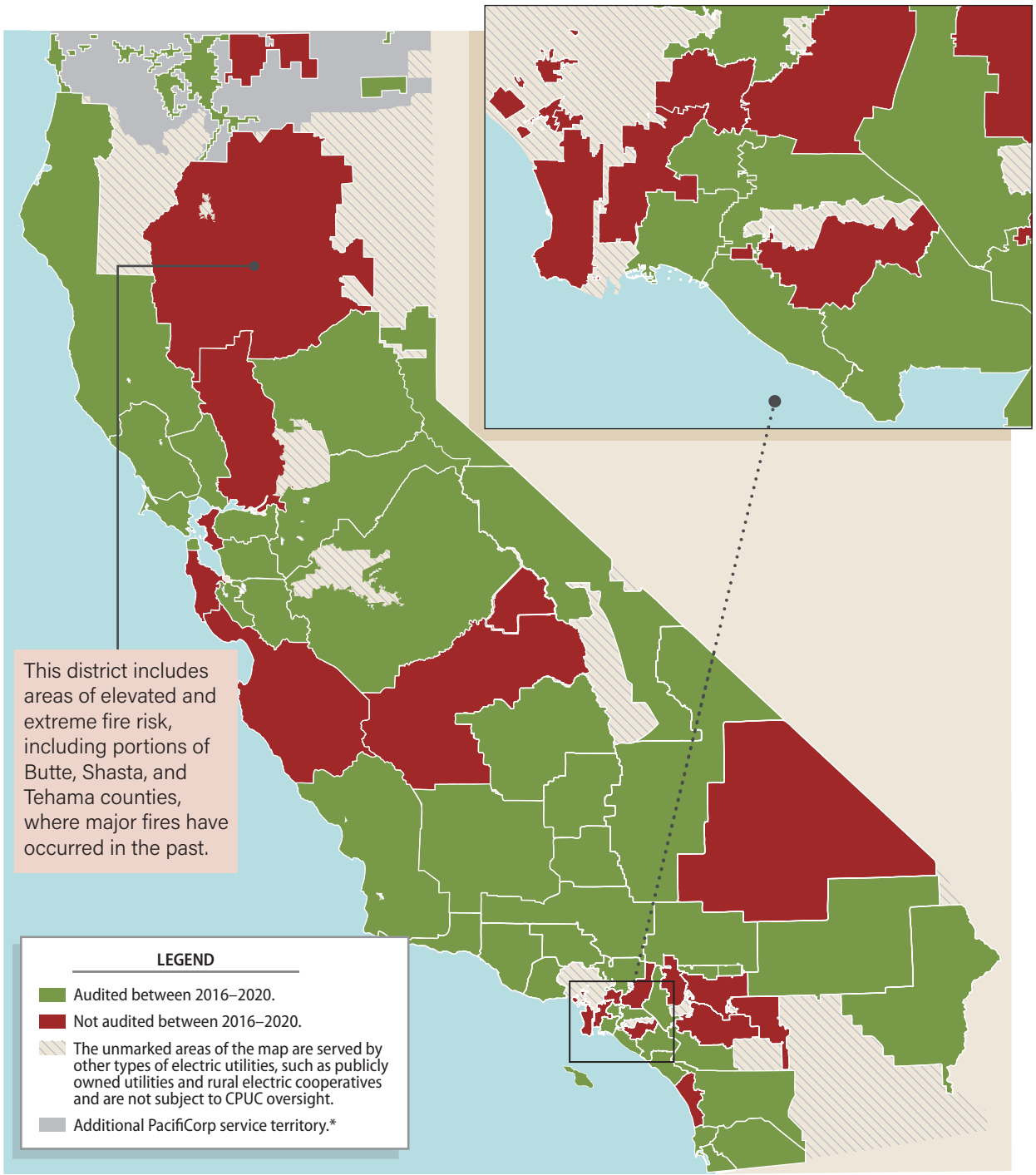
The CPUC does not consistently audit all utility districts, and for those audits it does perform, it cannot demonstrate that it prioritizes districts that are in areas of increased fire risk.[10] Although the safety and reliability program manager indicated that the CPUC's audit manual calls for it to audit each utility's districts within a five-year cycle, we found that the CPUC did not audit each power line distribution district (distribution district) within the most recent five-year period, as we show in Figure 12. Specifically, we noted that during the five-year cycle of 2016 through 2020, the CPUC audited fewer than 70 percent of the utilities' distribution districts. The safety and reliability program manager indicated that the CPUC was unable to complete all of those audits because the branch had other duties, including investigating utility-related wildfires, which necessitated significant efforts and limited its ability to perform additional audits. However, the safety and reliability program manager also acknowledged that since 2019, the branch has had a diminished role in investigating these fires.

The CPUC does not consistently audit all utility districts, and for those audits it does perform, it cannot demonstrate that it prioritizes districts that are in areas of increased fire risk.

[9] We reviewed the CPUC's distribution and transmission power line audits, which address overhead and underground electrical systems.

[10] Utility districts are geographic service areas designated by utilities.

Figure 12
It Has Been More Than Five Years Since the CPUC Audited Certain Utility Districts


This district includes areas of elevated and extreme fire risk, including portions of Butte, Shasta, and Tehama counties, where major fires have occurred in the past.
LEGEND
Audited between 2016–2020.
Not audited between 2016–2020.
The unmarked areas of the map are served by other types of electric utilities, such as publicly owned utilities and rural electric cooperatives and are not subject to CPUC oversight.
Additional PacifiCorp service territory.*

Source: CPUC utility district audits from 2016 through 2020 and utility district maps.

* According to the CPUC's Electric Safety and Reliability Branch program manager, a large portion of PacifiCorp's service territory is national forest, and approximately 60 percent has designations that limit growth, and thus the need for utility assets. She further explained that no distribution equipment or customers are present there.

The CPUC did not audit several districts that contain areas of elevated or extreme fire risk. Notably during the five-year period from 2016 through 2020, the CPUC failed to conduct audits of distribution power lines in counties that contain areas of elevated and extreme fire risk, including portions of Butte, Tehama, and Shasta counties—where major fires have occurred in the past. Although the safety and reliability program manager stated that the CPUC used risk factors identified in the audit manual, including past audit performance, accident data, or indications of safety or reliability problems, she was unable to provide any documentation showing how the risk factors were applied when selecting which districts to audit. As a result, the CPUC could not demonstrate how it weighs the risk of utility-caused wildfires when prioritizing the audits it performs.

We also found that the CPUC does not use its authority to penalize utilities when its audits uncover violations. In 2014 the CPUC adopted an electric safety citation program that gave staff the authority to issue penalties for certain violations of law and of General Orders, including those identified through audits. However, as of November 2021, the CPUC had not issued any penalties resulting from violations that its safety and enforcement division found during audits. The safety and reliability program manager informed us that it is the CPUC's practice to issue penalties for significant issues, which may be found through incident investigations where individuals were hurt or killed, or where buildings were destroyed, but that these types of immediate safety hazards are rarely found during audits.

The CPUC does not use its authority to penalize utilities when its audits uncover violations.

In our review of CPUC audits, we identified several instances where the CPUC identified violations of General Orders that were the same as those for which it issued penalties in incident investigations. For example, the CPUC issued a $2.5 million penalty to a utility in 2021 for nearly 55,000 violations of a General Order requiring inspections of distribution poles, and we found that the CPUC had identified similar issues in at least two of its distribution district audits. The CPUC identified more than 200 violations of the same General Order in one 2020 distribution district audit, and about 2,400 similar violations in a second 2020 distribution district audit. Additionally, we found that in 2017 the CPUC issued

a $50,000 penalty to a utility for a single violation of a General Order requiring vegetation management. Although we identified three audits that the CPUC performed in 2019 and 2020 that identified similar violations, it did not issue any penalties for those violations.

We asked the CPUC for perspective on why it did not issue penalties for audit findings. The safety and reliability program manager indicated that penalties may be viewed as a punitive method for gaining compliance, but they do not necessarily ensure an increase in the utility's compliance. However, the CPUC issues penalties for violations of General Orders it uncovers during incident investigations, and if it believes that those penalties are merited, it is not clear why similar violations discovered during audits should not be similarly penalized. Because the CPUC's mission includes assuring that utility services are safe, its focus should be on preventing deficiencies that could result in negative outcomes, rather than only imposing penalties after an incident such as a fire, injury, or death. Although penalties associated with audit findings may not result in the same dollar amounts as those applied after an investigation, issuing penalties based on audit findings would elevate the importance of the safety practices that CPUC audits review.

Recommendations

Legislature

To better hold utilities accountable for safely operating the electrical grid, the Legislature should require the CPUC to do the following:

- Create and implement a risk-based audit plan for transmission and distribution infrastructure audits that prioritizes districts based on risk factors, including high fire-threat areas, and aligns with the requirement established in its audit manual to audit each district at least once every five years.

- Create a schedule of penalties for violations identified through its audit process and apply the schedule pursuant to its existing authority to impose penalties established in state law.

Energy Safety Office

To ensure that utilities are targeting the areas of highest fire risk for mitigation activities, the Energy Safety Office should revise its internal procedures for reviewing mitigation plans by March 2023

to designate the prioritization of mitigation activities as a critical issue that must be appropriately addressed before a mitigation plan can be approved.

To make mitigation plans more responsive to the causes of fires and serious concerns raised through oversight mechanisms, the Energy Safety Office should require in its 2023 mitigation plan guidelines that utilities address issues identified by oversight mechanisms—such as external audits—in their mitigation plans.

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Other Areas We Reviewed

Recent Audits of Utilities' Mitigation Expenditures

Recent audits of utility expenditures questioned whether the CPUC should allow the three largest utilities to recover through their rates approximately $2.5 billion, collectively, as wildfire mitigation costs. According to the CPUC, ratemaking is done on a prospective basis, and its practice is not to authorize increased rates to account for previously incurred costs. The general rate case dictates the electrical rates that the utilities can charge customers for the cost of owning, operating, and maintaining their facilities, and they include the cost of utilities' efforts to mitigate the risk of causing wildfires. However, state law requires utilities to track in a specific account (mitigation account) actual expenditures for fire risk mitigation that are not otherwise covered by rates approved in their general rate case. State law also allows utilities the alternative to recover those costs through an application for cost recovery at the end of the period covered by the mitigation plan. Under either scenario, the utility must certify that it did not receive authorization for the costs from a previous proceeding.

In June 2020—with the Wildfire Safety Division, the predecessor to the Energy Safety Office, acting as a project manager—CPUC hired a contractor to assess whether costs in the six utilities' 2019 and 2020 mitigation plans duplicated expenditures approved in previous general rate cases. The audit reports for PG&E, SCE, and SDG&E determined that nearly $2.5 billion in costs were already paid for through the utilities' previously approved rates, or that additional justification and documentation from the utilities was necessary to make a determination of whether the costs were already paid for through the utilities' previously approved rates. The utilities disagreed with many of the audit results and in several instances stated either that they did not intend to claim reimbursement for the costs in question or that they disagreed with the contract auditor about whether the costs were part of the activities described in their general rate case. Nevertheless, the contract auditor generally stood by its findings and in multiple instances stated that utilities should provide additional information or that the CPUC should carefully monitor future claims by the utilities to ensure that these costs are not passed on to customers again in the form of higher rates.

The CPUC's Energy Division program manager stated that there are several safeguards in place to prevent utilities from double-charging customers for the same expenditures. Specifically, she discussed how the CPUC's proceedings for setting rates may include requiring utilities to provide proof that expenditures are different from those authorized in the past. She also cited the involvement of others, such as outside stakeholder groups, filing protests during

those proceedings and in some cases the individual overseeing the proceeding, the utility itself, or an advocates office ordering or conducting an audit. However, the recently conducted audits highlight potential weaknesses in the rate-setting process, and until the CPUC addresses these findings, questions remain about the appropriateness of the rates utilities are authorized to charge.

Recommendations

To ensure that it does not authorize cost recovery, and the resulting rate increases, for activities that were part of a utility's previous general rate case, the CPUC should perform audits of the utilities' wildfire mitigation costs before approving recovery of those costs. In addition, the CPUC should implement sufficient safeguards to ensure the appropriateness of the costs passed on to customers.

To ensure that utilities do not over-recover, or charge ratepayers more than they should for the activities they perform, the CPUC should make certain that if utilities request reimbursement for the costs questioned in the contractor audits, the utilities provide sufficient quantifiable and detailed analyses to substantiate that the costs were not paid for through the utilities' previously approved rates.

CPUC Safety Culture Assessments

The CPUC has not required safety culture assessments of utilities, which are reviews that emphasize appropriately prioritizing employee safety and that are responsive to risk factors, such as wildfires—pursuant to the state law that requires such assessments. An amendment to state law that took effect in January 2019 established that the Commission must require a safety culture assessment of each of the utilities by an independent third-party evaluator at least once every five years. Because catastrophic safety failures often result from multiple failures, rather than the action or inaction of a single individual, a safety culture supports the process of identifying hazards and implementing adequate safeguards throughout the organization. Essentially, a safety culture is a set of organizational principles, beliefs, and norms in which safety is a predominant objective and is continuously reinforced. Safety culture assessment practices in other industries often include document reviews and interviews with and surveys of staff throughout the organization. However, the CPUC did not initiate a rulemaking for performing safety culture assessments until October 2021.

The Commission delayed initiating its safety culture assessment rulemaking for more than two years after the state law took effect. The amendment to state law requiring these assessments also

established the requirement for utilities to annually prepare and submit a mitigation plan, among other things. According to the director for the CPUC's Safety Policy Division (safety policy director), in implementing the new state law, the CPUC focused on developing the process for mitigation plans and developing and implementing policy related to wildfire cost recovery. He explained that the CPUC anticipates that it will be ready to begin conducting culture assessments in 2023. When we asked why the CPUC did not prioritize the safety culture requirement, the safety policy director indicated that the five-year period for safety culture assessments seemed less time sensitive than other requirements, such as developing a process for annual mitigation plans. According to the program manager for the Safety Policy Division, the CPUC views the PG&E safety culture assessment resulting from the San Bruno explosion as the first assessment conducted under this new state law. However, this assessment was initiated in April 2016, more than two years before the law requiring safety culture assessments took effect. Further, the CPUC had not yet initiated a rulemaking for conducting these safety culture assessments when the PG&E assessment began. Nonetheless, until the CPUC begins requiring culture assessments as state law requires, it lacks assurance of the extent to which utilities' cultures are prioritizing safety.

The Energy Safety Office's Compliance Program

In September 2021, the Energy Safety Office established emergency regulations for the process it uses to ensure that utilities comply with mitigation plans and requirements related to mitigating the risk of wildfires. State law authorizes the office to issue a notice of defect or notice of violation, which we refer to collectively as *compliance notices*, to direct utilities to correct any noncompliance with approved mitigation plans, laws, regulations, or guidelines, and it authorizes the office to perform compliance investigations. According to emergency regulations that took effect in September 2021, a *notice of defect* identifies a deficiency, error, or condition that requires correction because it increases the risk of ignition posed by electrical lines and equipment. A *notice of violation* identifies noncompliance with an approved mitigation plan, law, regulation, or guideline within the Energy Safety Office's authority, such as failing to perform inspections described in a mitigation plan.

The Energy Safety Office's emergency regulations allow it to issue compliance notices on a temporary basis, but it is in the process of creating permanent regulations. The emergency regulations will expire in June 2022; however, the Energy Safety Office's general counsel stated that the office has engaged a contractor to help manage the implementation of permanent regulations.

We conducted this performance audit in accordance with generally accepted government auditing standards and under the authority vested in the California State Auditor by Government Code section 8543 et seq. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on the audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Respectfully submitted,

MICHAEL S. TILDEN, CPA
Acting California State Auditor

March 24, 2022

Appendix A

Scope and Methodology

The Joint Legislative Audit Committee (Audit Committee) directed the California State Auditor to conduct an audit of the role of the CPUC in ensuring a safe and reliable electrical system in California. Because the Legislature transferred all of the functions of the CPUC's Wildfire Safety Division to the Office of Energy Infrastructure Safety during the course of our audit, we included the office in our review. Specifically, we reviewed the CPUC's audit process to determine whether it consistently assessed utilities' compliance with General Orders, determined whether the three largest utilities submitted required elements for their 2020 safety certifications, and assessed the CPUC's efforts to oversee utilities' power shutoffs. We also reviewed the Energy Safety Office's review and approval of mitigation plans and safety certifications. Table A lists the objectives that the Audit Committee approved and the methods we used to address them.

Table A
Audit Objectives and the Methods Used to Address Them

	AUDIT OBJECTIVE	METHOD
1	Review and evaluate the laws, rules, and regulations significant to the audit objectives.	Reviewed relevant laws and regulations related to electrical grid safety as well as the CPUC's General Orders.
2	Review the CPUC's mission and determine whether the CPUC is performing all of its required functions related to overseeing the safety of the electrical system.	• Selected and reviewed the approved 2020 safety certifications of the three largest utilities, each with more than 250,000 customers. • Determined whether the utilities submitted all required elements for their 2020 safety certifications. • Reviewed the CPUC records of completed audits to determine whether the CPUC performed audits from 2016 through 2020 in a timely manner. • Evaluated the CPUC's process for complying with the requirement in state law that utilities submit safety culture assessments. • Reviewed the CPUC's process for evaluating the sufficiency of RAMPs. We found that although the CPUC's development of this process is ongoing, it has implemented requirements for utilities to demonstrate that they are prioritizing safety in their risk framework. The CPUC is currently undertaking a rulemaking proceeding to improve this process. • Determined whether the Energy Safety Office issued any corrective actions before approving the utilities' 2021 mitigation plans.

continued on next page . . .

	AUDIT OBJECTIVE	METHOD
3	For the past five years, evaluate the steps that the CPUC has taken to oversee the safety of utilities' electric systems by determining the following: a. The staffing and budget resources the CPUC has allocated to this purpose. b. Whether the CPUC has assessed needed infrastructure improvements. c. Whether the CPUC has developed all reasonable wildfire mitigation protocols. d. Whether the CPUC has identified and procured needed wildfire mitigation equipment.	• Obtained and reviewed budgeted and actual expenditures for the CPUC for the past five fiscal years. • Reviewed budget change proposals submitted by the CPUC and the Energy Safety Office over the past five years, from fiscal years 2016–17 through 2020–21. We concluded that the CPUC requested additional staff positions from fiscal years 2017–18 through 2020–21, some of which were positions for the establishment of the Energy Safety Office. • Analyzed the Energy Safety Office's data to determine the total mileage of utility power lines in the State and the total mileage of utility power lines in high fire-threat areas. We found that the six investor-owned utilities reported to the Energy Safety Office that they have nearly 277,000 miles of power lines in the State, and of those, more than 74,000 miles are in high fire-threat areas. • Determined the total miles of power lines that have undergone improvement to mitigate the risk of wildfire in fiscal year 2020–21—such as covering conductors, burying lines, and vegetation removal using available CPUC and Energy Safety Office GIS data. • Obtained data from the CPUC for the past five years to determine the number and location of fires the three largest utilities reported causing. • Obtained power line data from the CPUC and the Energy Safety Office but determined that both entities lacked the historical data necessary for us to determine how many miles of power lines in high fire-threat areas the utilities have improved to mitigate the risk of wildfire for the last five years. • Obtained data from the CPUC for the past five years to determine the number and location of fires caused by the three largest utilities. • Reviewed standards for equipment in other localities and countries and found few requirements for installing covered power lines or otherwise hardening electrical grids. We found that Victoria, a state in Australia, requires that all new or replaced electrical lines be either covered or underground. We discussed utilities' needs to make improvements to the electrical grid in our report. • Obtained CPUC's perspective on setting design standards for power line hardening in high fire-threat areas. CPUC expressed concerns that establishing design standards for equipment in high fire-threat areas would limit flexibility and innovation and would not be a good alternative to its risk-based decision-making oversight.
4	For the past five years, review the CPUC's efforts to fulfill its mission through its oversight of utilities' power shutoffs by determining the following: a. Whether the CPUC's oversight decisions have been objectively reasonable and consistent with its mission, state laws, and CPUC rules and regulations. b. Whether the CPUC's efforts have been appropriately targeted and whether the outcomes of these efforts are being appropriately tracked, measured, and evaluated. c. The extent to which the CPUC is reporting accurate and reliable information and data on power shutoffs.	• Reviewed factors the CPUC may evaluate after a power shutoff to determine reasonableness. • Reviewed the CPUC's process for evaluating post-event reports to determine if the process is sufficient and appropriate. Selected five power shutoff post-event reports and determined whether the CPUC's assessment addressed key elements. • Determined whether CPUC's power shutoff draft compendium includes key elements from the relevant CPUC General Orders. • Reviewed the CPUC's efforts to track, measure, and evaluate utilities' corrective actions in response to post-event report findings for the five reports we selected. We determined that it does not currently follow up on these issues. • Reviewed 15 post-event reports from 2020 and 2021 and determined if there was damage to the utility's infrastructure during the shutoff that could have created a wildfire ignition had the shutoff not occurred.
5	Evaluate the processes the CPUC has established for reviewing and approving utilities' plans for power shutoffs or, in the case of PG&E, its biweekly reports. Include an identification and evaluation of the criteria the CPUC uses to review and approve the plans and reports.	• Determined whether the CPUC or the Energy Safety Office assesses whether the thresholds utilities use for triggering a power shutoff are sufficient and appropriate and concluded that they do not perform such assessments. • Identified the criteria for PG&E's biweekly reports established in a Commission ruling. We reviewed two biweekly reports and found that they contained the required elements. We also determined that the CPUC released PG&E from the requirement to submit biweekly reports in November 2021.

	AUDIT OBJECTIVE	METHOD
6	Evaluate whether any identified concerns should be addressed through changes in state law or the CPUC's practices.	Interviewed key staff and reviewed relevant materials to determine if the Energy Safety Office requires utilities to address issues identified by oversight mechanisms in their mitigation plans.
7	Review and assess any other issues that are significant to the audit.	• Reviewed relevant program information and determined that the microgrid incentive program is currently designed to incentivize placement of microgrids in areas that are at most risk for power shutoffs and that will be most adversely affected by power outages. The anticipated program launch date is 2022. • Assessed the criteria for the CPUC's solar incentive program and concluded that it provides financial incentives to increase grid resiliency for communities in high fire-threat districts. • Assessed the criteria for the CPUC's net energy metering (NEM) program and interviewed staff. The CPUC has not, to date, adopted a decision relating to NEM that prioritizes high fire-threat districts.

Source: Audit workpapers.

Assessment of Data Reliability

The U.S. Government Accountability Office, whose standards we are statutorily obligated to follow, requires us to assess the sufficiency and appropriateness of the computer-processed information we use to support our findings, conclusions, and recommendations.

In performing this audit, we relied on extracts from the CPUC's accounting system to determine its total expenditures for regulatory purposes and its expenditures related to regulating electric utilities for fiscal years 2016–17 through 2020–21. The data came from the California State Accounting and Reporting System (CALSTARS) and the Financial Information System for California (FI$Cal). However, a report our office issued in February 2022 identified findings in FI$Cal's overall information technology general controls environment.[11] These deficiencies resulted in pervasive risks that impact the ability to rely on FI$Cal data used for financial reporting. Because of the multiple systems involved and our inability to rely on information reported in FI$Cal, it was not cost-effective to conduct a data reliability assessment.

We obtained cost data for large wildfires and other significant events from 2015 through 2021 from the National Interagency Fire Center to identify fire suppression costs. Because we use these data solely for background or context, we determined that a data reliability assessment was not necessary.

[11] *State of California: Internal Control and Compliance Audit Report for the Fiscal Year Ended June 20, 2020*, Report 2020-001.1.

We obtained data from the CPUC identifying the microgrid projects funded through the EPIC program from 2015 through 2020 to determine the number of microgrids it funded. Because we used these data solely for background or context, we determined that a data reliability assessment was not required.

We obtained a list of utility distribution districts from the CPUC to determine whether it had performed audits of each district. To evaluate the data, we performed dataset verification and identified no issues. We verified the accuracy and completeness of the data by comparing the CPUC's utility distribution district list to the utilities' district maps and found that the list did not include three utility districts. We obtained corrected information that aligned with the district maps and used this list for our analysis. Although we found the CPUC's list of utility district data to be not sufficiently reliable for the purposes of determining the full list of utility distribution districts, the corrected information provided sufficient evidence in total to support our findings, conclusions, and recommendations.

We obtained ignition data reported by PG&E, SCE, and SDG&E to the CPUC from 2015 through 2020 to determine the causes of utility-caused ignitions. To evaluate these data, we performed dataset verification procedures and electronic testing of key data elements and did not identify any issues. We were unable to perform accuracy and completeness testing for these data because the three utilities provided the ignition data to the CPUC; thus the data cannot be corroborated. As a result, we concluded that they are of undetermined reliability. Although this determination may affect the precision of the numbers we present, there is sufficient evidence in total to support our findings, conclusions, and recommendations.

We obtained data on outages caused by PG&E's power-line settings program from July 2021 through November 2021 from the CPUC. We used these data to determine the number of unplanned outages, the average outage time per customer, and the number of customers impacted as a result of these outages. To evaluate these data, we performed dataset verification procedures and electronic testing of key data elements and did not identify any issues. We were unable to perform accuracy and completeness testing for these data because it is the only source of unplanned outage data available and therefore could not be compared against another source. As a result, we concluded that the data are of undetermined reliability. Although this determination may affect the precision of the numbers we present, there is sufficient evidence in total to support our findings, conclusions, and recommendations.

We obtained CPUC data on power shutoff events since 2013 to determine whether the CPUC is reporting accurate and complete information on the power shutoff events and to calculate summary information regarding those events. We performed accuracy testing on a random sample of five power shutoff events by tracking key data elements to their supporting post-event reports, and we found more than one error each in the power shutoff event end dates and the total customers impacted. We also traced all post-event reports available on the CPUC website to the CPUC data to ensure that all power shutoff events from 2017 through 2021 were accounted for in the data. We found that data for five power shutoff events were missing, and we compiled summary information for those missing events. We concluded that the detailed data were not sufficiently reliable for our purposes. Although this determination may affect the precision of the numbers we present, there is sufficient evidence in total to support our findings, conclusions, and recommendations.

We relied on electronic data obtained from the Energy Safety Office that contain geographical data it obtained from the six utilities for the period July 2020 through June 2021. We performed electronic testing of the data and interviewed staff knowledgeable about the data. We found the Energy Safety Office's data to be of undetermined reliability for our purpose of determining the status of power lines throughout the State and assessing the utilities' mitigation efforts. Although this determination may affect the precision of the numbers we present, there is sufficient evidence in total to support our findings, conclusions, and recommendations.

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Appendix B

Summary of Public Safety Power Shutoffs

Table B reflects the total number of power shutoff events the utilities implemented from 2013 through 2021. The table includes the minimum and maximum length of each power shutoff and the total number of customers affected per event.

Table B
Summary of Public Safety Power Shutoff (PSPS) Events

UTILITY	PSPS YEAR	PSPS START DATE	PSPS END DATE	MINIMUM AND MAXIMUM LENGTH OF POWER SHUTOFF (HOURS)	TOTAL CUSTOMERS IMPACTED
SDG&E	2013	5-Oct	6-Oct	5.52–8.88	183
SDG&E	2014	14-Jan	15-Jan	19.52–32.1	85
SDG&E		14-May	15-May	7.43–32.3	1,192
SDG&E		24-Nov	25-Nov	9.45–12.62	90
SDG&E	2017	21-Sep	22-Sep	18.33–18.33	3
SDG&E		20-Oct	21-Oct	37.97–37.97	3
SDG&E		23-Oct	25-Oct	6.1–50.82	175
SDG&E		5-Dec	11-Dec	21.07–144.87	2,164
SDG&E		14-Dec	15-Dec	9.12–17.28	658
PG&E	2018	14-Oct	17-Oct	12.6–60.38	60,086
SDG&E		15-Oct	16-Oct	7.08–27.7	379
SDG&E		19-Oct	20-Oct	30.53–30.53	19
SDG&E		11-Nov	16-Nov	5.48–93.68	24,081
PG&E	2019	8-Jun	9-Jun	11.77–20.63	22,327
SCE		16-Sep	19-Sep	*	14,500
PG&E		23-Sep	26-Sep	0.4–32.12	69,627
SCE		24-Sep	24-Sep	5.8–5.8	85
PG&E		5-Oct	6-Oct	12–17.7	11,304
PG&E		8-Oct	12-Oct	5.37–89.13	728,980
SCE		9-Oct	12-Oct	0.02–62.77	24,113
SDG&E		10-Oct	11-Oct	18.53–23.72	395
SCE		16-Oct	21-Oct	3.78–25.37	440
PG&E		23-Oct	25-Oct	5.13–51.55	176,620
SCE		23-Oct	28-Oct	2.32–106.18	30,958
SDG&E		24-Oct	1-Nov	0.13–58.25	47,616
SCE		27-Oct	3-Nov	4.87–110.33	126,364
PG&E		26-Oct	4-Nov	0.02–162.77	941,269
SCE		17-Nov	17-Nov	4.7	49

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UTILITY	PSPS YEAR	PSPS START DATE	PSPS END DATE	MINIMUM AND MAXIMUM LENGTH OF POWER SHUTOFF (HOURS)	TOTAL CUSTOMERS IMPACTED
SDG&E		17-Nov	18-Nov	*	21
PG&E		20-Nov	21-Nov	7.43–38.68	49,086
SCE		25-Nov	27-Nov	5.67–42.8	1,192
SCE	2020	2-Aug	4-Aug	44.27	17
PG&E		7-Sep	13-Sep	0.03–133.83	168,599
SDG&E		8-Sep	9-Sep	3.4–13.5	49
SCE		9-Sep	11-Sep	8.92–54.78	252
PacifiCorp		13-Sep	14-Sep	7.6–32.9	2,559
PG&E		26-Sep	29-Sep	14.65–60.48	64,295
PG&E		13-Oct	17-Oct	0.02–62.95	40,574
SCE		16-Oct	16-Oct	4.5–9.75	86
PG&E		21-Oct	23-Oct	7.2–47.48	30,154
PG&E		25-Oct	28-Oct	1.45–78.92	345,470
SCE		26-Oct	28-Oct	7.08–57.02	36,257
SDG&E		26-Oct	27-Oct	5.47–8.12	4,373
SCE		6-Nov	7-Nov	3.2–20.65	1,327
SCE		16-Nov	18-Nov	2.67–38.17	506
SCE		26-Nov	28-Nov	0.27–53.43	20,619
SCE		2-Dec	4-Dec	0.32–56.15	63,494
SDG&E		2-Dec	9-Dec	12.1–61.68	89,505
PG&E		2-Dec	3-Dec	0.76–22.07	617
SCE		7-Dec	11-Dec	0.27–53.75	78,997
SCE		18-Dec	24-Dec	0.18–31.48	27,513
SDG&E		23-Dec	24-Dec	7.58–23	6,797
SCE	2021	14-Jan	21-Jan	3.52–175.83	116,234
PG&E		18-Jan	26-Jan	10.7–184.02	5,099
SCE		13-Apr	13-Apr	2.87	78
PG&E		17-Aug	20-Aug	15.98–62.65	48,155
PacifiCorp		17-Aug	18-Aug	4.77–9.2	1,953
PG&E		20-Sep	21-Sep	7.72–18.58	2,968
SCE		30-Sep	30-Sep	9.82	9
PG&E		11-Oct	14-Oct	11.98–79.35	23,504
SCE		11-Oct	12-Oct	20.17–21.05	40
SCE		15-Oct	16-Oct	5.2–26.27	67
PG&E		15-Oct	16-Oct	13.17–39.42	666
SCE		22-Oct	22-Oct	7.05	112
SCE		24-Nov	26-Nov	*	78,514
SCE		21-Nov	22-Nov	*	5,235
SDG&E		24-Nov	26-Nov	*	5,858

Source: The CPUC's utility-reported power shutoff data.

* During our data reliability assessment, we identified five events not included in the CPUC's data. According to the CPUC, it inadvertently excluded two 2019 power shutoffs and it did not include three 2021 power shutoffs because the utilities had not yet submitted their data in the correct format. We obtained general information regarding the power shutoffs, but detailed duration information was not available.

STATE OF CALIFORNIA GAVIN NEWSOM, *Governor*

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

March 4, 2022

Michael Tilden, CPA*
Acting California State Auditor
621 Capitol Mall, Suite 1200
Sacramento, CA 95814

CALIFORNIA PUBLIC UTILITIES COMMISSION RESPONSE TO CSA AUDIT (2021-117) - ELECTRICAL SYSTEM SAFETY AUDIT

Dear Mr. Tilden:

The California Public Utilities Commission (CPUC) hereby provides our response to the draft report findings of the California State Auditor's (CSA) report entitled, *Electrical System Safety: California's Oversight of the Efforts by Investor-Owned Utilities to Mitigate the Risk of Wildfires Needs Improvement.*

The CPUC is committed to the continuous improvement of its operations. Accordingly, the CPUC will establish a corrective action plan and timelines toward implementing the recommendations identified in this report.

The CPUC appreciates the work performed by the CSA and the opportunity to provide our response to the findings. If you have further questions, please contact me at (415) 757-7844 or Staff Attorney Matt Yergovich at (415) 596-3474.

Sincerely,

Rachel Peterson

Rachel Peterson
Executive Director

Enclosure

cc: Alice Reynolds, President
California Public Utilities Commission

Christine Hammond, General Counsel
Legal Division

Angie Williams, Director
Utility Audits, Risk and Compliance Division

* California State Auditor's comments begin on page 67.

CALIFORNIA PUBLIC UTILITIES COMMISSION RESPONSE TO CSA AUDIT (2021-117) - ELECTRICAL SYSTEM SAFETY OVERSIGHT AUDIT

"California's Oversight of the Efforts By Investor-Owned Utilities to Mitigate the Risk of Wildfires Needs Improvement"

Finding 1: The CPUC's Audits Could Be Improved to Ensure That Utilities are Performing Critical Wildfire Mitigation Efforts In High-Risk Areas.

To better hold utilities accountable for safely operating the electrical grid, the Legislature should require the CPUC to do the following:

> **Recommendation A:** Create and implement a risk-based audit plan for transmission and distribution infrastructure audits that prioritizes districts based on risk factors, including in high fire-threat areas, and aligns with the requirement established in its audit manual to audit each district at least once every five years.

CPUC Response: ☒ Agrees ☐ Disagrees with the recommendation or partially agrees.

This recommendation is for the Legislature. The CPUC also agrees that it should use a risk-based approach for audits and will take steps to ensure its procedures reflect this approach and are implemented.

Additionally, the CPUC notes the following considerations relevant to create and implement a risk-based audit plan.

The term "audit" associated with this recommendation refers to the reviews and inspections performed by the CPUC's Safety Enforcement Division (SED). The CPUC appreciates that the California State Auditor's report recognizes the CPUC's constitutional responsibilities to ensure safety more broadly than just wildfire safety; consistent with this mandate the CPUC takes an "all risks" approach. The CPUC will also consider whether this recommendation can be implemented with existing resources.

> **Recommendation B:** Create a schedule of penalties for violations identified through its audit process and apply the schedule pursuant to its existing authority to impose penalties established in state law.

CPUC Response: ☐ Agrees ☒ Disagrees with the recommendation or partially agrees.

This recommendation is for the Legislature. The CPUC notes that if the Legislature adopts the
(1) recommendation, it will require implementation time to conform the changes to the Commission's existing enforcement orders. The CPUC also partially agrees in that it will consider options for penalty schedules, noting they must take into account the following considerations relevant to the development of a schedule of penalties, among others.

First, the CPUC notes the importance of its statutory Notice of Violations (NOV) enforcement
(2) mechanism. NOVs serve as an initial, timely first step of enforcement that can be used to correct utility deficiencies to prevent negative outcomes without citations or penalties. An NOV identifies potential (alleged) violations and provides the utility an opportunity to rectify the deficiency promptly.

Second, the CPUC notes that it will require time to undertake proceedings necessary to expand the CPUC's existing rules delegating penalty authority to SED staff. See Decision 16-09-055 (Phase Two Decision Adopting Necessary Improvements and Refinements to the Gas and Electric Safety Citation Programs). Any penalty schedule proposed for the Commission's consideration must satisfy requirements prescribed by the Constitution, statute, and Commission orders.

Finding 2: (In Re:) Recent Audits of Utilities' Mitigation Expenditures.

> **Recommendation:** To ensure that it does not authorize cost recovery, and the resulting rate increases, for activities that were part of a utility's previous general rate case, the CPUC should perform audits of the utilities' mitigation costs before approving recovery of those costs. In addition, the CPUC should implement sufficient safeguards to ensure the appropriateness of the costs passed on to customers.

CPUC Response: ☒ Agrees ☐ Disagrees with the recommendation or partially agrees.

The CPUC agrees it is critical to not allow double-recovery of costs. The CPUC is committed to taking additional actions to assess whether safeguards provided through current ratemaking processes and wildfire mitigation cost reviews ensure appropriate cost approval, or if additional safeguards or audits (a term that includes a variety of possible cost recovery review processes) are needed and feasible.

First, to provide an overview of existing processes that provide safeguards against double recovery of costs: The CPUC's evidentiary hearing litigation serves as a critical platform for the CPUC and other experts to scrutinize, test, and challenge the veracity and prudence of utilities' costs. These heavily-litigated proceedings place the burden of proof on utilities to demonstrate the reasonableness of proposed costs and allow intervenors to challenge them. Through these processes, many of which are dictated by statute, the CPUC ensures that costs approved are just and reasonable, and incremental where the application is filed outside of a general rate case. We will review these safeguards to ensure they sufficiently protect ratepayers in light of the significant costs being incurred to prevent destructive wildfires. ③

Second, the CPUC agrees that it should assess the need for additional audits (or other cost recovery reviews) of wildfire mitigation expenditures conducted on appropriate time frames to inform cost recovery. An assessment is required to develop a specific course of action. The CPUC would require additional resources if consultants are engaged to validate utility wildfire mitigation spending approved in general rate cases and other decisions. These studies require time to complete, compliance with state contracting processes, and oversight by CPUC staff. The CPUC must also consider what time frame is most valuable to best inform general rate cases and other cost recovery applications. Accordingly, the CPUC is committed to assessing and developing recommendations on how to leverage the benefits of audits of utility wildfire mitigation expenditures on a meaningful and practicable time frame to inform ongoing approvals of wildfire mitigation costs.

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COMMENTS

CALIFORNIA STATE AUDITOR'S COMMENTS ON THE RESPONSE FROM THE CALIFORNIA PUBLIC UTILITIES COMMISSION

To provide clarity and perspective, we are commenting on the response to our audit from the CPUC. The numbers below correspond to the numbers we have placed in the margin of the response.

Our recommendation is not intended to suggest that the CPUC should issue penalties in violation of existing Commission orders. Rather, our recommendation is that the Legislature require the CPUC to create a schedule of penalties for violations, and apply that schedule pursuant to its existing authority to impose penalties established under state law. Nevertheless, as we state on pages 47 and 48, if the CPUC believes that imposing penalties is merited when a person is injured or dies, or buildings have been destroyed, it is not clear why similar violations discovered during audits should not also be penalized. (1)

The CPUC's existing methods for following up on the violations identified through its audits does not provide adequate assurance that those violations are addressed in a timely manner. According to the CPUC's safety and reliability program manager, it requires utilities to respond in writing to the violations it identifies. For violations of certain general orders, the utility may provide a response indicating that it will resolve the violation within a year. However, the CPUC does not perform physical inspections or require in every instance that a utility provide evidence that the work was completed. Moreover, as we note on page 48, the CPUC already issues penalties for violations of General Orders it uncovers during incident investigations, so it is not clear why similar violations discovered during audits should not be similarly penalized. Because the CPUC's mission includes assuring that utilities' services are safe, its focus should be on encouraging utilities to proactively identify and address deficiencies that could result in negative outcomes. If CPUC issued penalties associated with audit findings, it would elevate the importance of the utilities' safety practices, and thus, we are recommending that the Legislature direct the CPUC to create a schedule of penalties for violations identified through its audit process. (2)

We stand by our recommendation that the CPUC should perform audits of utilities' mitigation costs before approving recovery of those costs. Although the CPUC cites the existence of various safeguards to prevent utilities from duplicating expenditures approved in (3)

previous general rate cases, which we describe on pages 51 and 52, relying on the efforts of other entities to question these costs is not a systematic method of fulfilling the CPUC's responsibility of ensuring that they are appropriate. The CPUC also describes placing the burden of proof on utilities to demonstrate the reasonableness of costs, but the requirement to do so provides little value without systematic oversight. Accordingly, it is unclear whether the CPUC's current practices identify cost recovery for activities that were a part of a utility's previous general rate case. We believe that our recommendation for the CPUC to perform audits of the utilities' mitigation costs before approving recovery of those costs will strengthen the CPUC's processes and better ensure utilities do not recover costs approved in a previous general rate case.

State of California – A Natural Resources Agency
Gavin Newsom, Governor

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Caroline Thomas Jacobs, Director

March 4, 2022

Michael Tilden, CPA*
Acting California State Auditor
1621 Capitol Mall, Suite 1200
Sacramento, CA 95814

Dear Acting Auditor Tilden,

The Office of Energy Infrastructure Safety (Energy Safety) acknowledges receipt by the Natural Resources Agency of the California State Auditor's (CSA) redacted draft report titled "California's Oversight of the Efforts By Investor-Owned Utilities to Mitigate the Risk of Wildfires Needs Improvement" (Report).

Energy Safety appreciates CSA's audit and recommendations intended to make the state safer. Utility wildfire safety is an immensely complex problem that requires expert technical knowledge and the ability to balance overarching, and sometimes competing, goals to achieve meaningful change. As Energy Safety has said in many forums, utilities will not get ahead of their wildfire risk until they reimagine how they build, operate, and manage their infrastructure. Energy Safety shares the CSA's perspective that the utilities must move faster and be smarter. (1)

Energy Safety shares many of the specific goals identified such as reducing adverse effects on Californians from public safety power shutoffs and unplanned outages as well as incentivizing utilities to advance their risk modeling and mitigation prioritization. Energy Safety defers to the Legislature as to whether the recommended legislative changes should be made to the statute. However, Energy Safety has the authority it needs to act on the concerns identified in the Report. (2) In the two years since its inception, Energy Safety has implemented many improvements to regulatory safety oversight as it has grown from the Wildfire Safety Division in the CPUC to the Office of Energy Infrastructure Safety under the California Natural Resources Agency. As this nascent department matures, it will continue to learn and drive utilities to move toward long-term wildfire safety.

Energy Safety's implementation of the legislative framework is progressing. In the short time since the birth of the department, there has been a massive shift in the way utilities plan for safety and implement those plans. Energy Safety has pushed the utilities to develop risk modeling, and respond to that modeling, in a way that did not exist before the department's creation. Energy Safety is confident this progress in wildfire safety planning and the associated

* California State Auditor's comments begin on page 79.

outcomes will compound over time and result in a vastly safer California. Energy Safety's responses to specific recommendations are detailed below.

Procedural Concerns

Energy Safety must caveat its response by noting that it was not provided an opportunity to review this report in its entirety when responding. Roughly 30% of the draft report Energy Safety received was redacted, notwithstanding that those portions appear to address the work that Energy Safety leadership and staff conducted as the Wildfire Safety Division when it was housed in the CPUC. One of three section headers and an entire recommendation, as well as many other pages of text, were redacted. Accordingly, readers of the Report should be aware that it may contain errors or statements that Energy Safety disagrees with, and that are not addressed in this response, because Energy Safety was not permitted to review them prior to preparing this response. Indeed, because Energy Safety has specialized expertise in the matters addressed by the Report, and Energy Safety staff has personal experience related to the functioning of the Wildfire Safety Division, to the extent those redacted portions address that experience and expertise, Energy Safety may provide further responses once the full Report is shared with the public. Energy Safety encourages readers of this response to consider it as preliminary until Energy Safety has had the chance to review this report in its entirety. ③

Background

On January 1, 2020, the WSD was established within the CPUC by Assembly Bill 1054 (Holden) and Assembly Bill 111[1] to oversee and enforce electrical corporations' compliance with new wildfire safety laws. Effective July 1, 2021, the division, including its leadership, staff, procedures, and authority, was transferred to the California Natural Resources Agency and reconstituted as a new department, called Energy Safety. Energy Safety's mission is to advance long-term utility wildfire safety by developing data-driven, comprehensive utility wildfire mitigation evaluation and compliance criteria, collaborating with local, state and federal agencies, and supporting efforts to improve utility wildfire safety culture and innovation.

The new regulatory framework created by AB 1054 and AB 111 is a unique and innovative approach to drive reduction of utility-related wildfire risk. Designed to incentivize safety investments and ensure utilities improve safety outcomes, the Legislature's approach relies on both incentives and deterrents.

To implement this new regulatory framework, Energy Safety recruited a talented pool of engineers, scientists, and analysts with a breadth of experience related to the complex issue of utility-related wildfire risk. In a very short time, Energy Safety has developed a new, comprehensive and data-informed approach for evaluating utility-related wildfire safety. Since January 2020, the WSD—and now Energy Safety—has increased standardization, transparency, and objectivity in the wildfire mitigation plan evaluation process. This includes designing

[1] AB 111 (Committee on Budget)

performance metrics to monitor progress on mitigation initiatives and their impact on safety outcomes, establishing a rigorous compliance assurance program, implementing a first-of-its-kind utility wildfire maturity model, and developing a unique safety culture assessment process that reviews both traditional workplace safety dynamics and wildfire and public safety.

In two short years, in addition to hiring, equipping, and training a full team of experts, developing procedures and protocols, and successfully standing up both a new division within the CPUC and subsequently a new department under the Natural Resources Agency—Energy Safety has successfully completed all its statutory responsibilities, including:

- Evaluated 17 wildfire mitigation plans across more than 50 specific technical areas, including within grid design, asset inspections and maintenance, vegetation management, and grid operations
- Designed and conducted 8 first-of-its-kind safety culture assessments
- Reviewed for approval or issuance 9 executive compensation structures and 9 safety certification submissions
- Conducted more than 14,000 inspection activities
- Identified and directed corrective action for more than 500 defects and violations
- Conducted 15 performance audits and independent evaluations of mitigation plan implementation
- Issued numerous policy guidelines to facilitate the above.

Foundational to all of Energy Safety's work is its insistence that California's electrical corporations constantly and continually improve their wildfire safety efforts. Energy Safety expects and pushes utilities to do more and to be better—to think more deeply, be smarter, and be more aggressive in their wildfire mitigation efforts.

Energy Safety is committed to continuing to build upon the novel and innovative regulatory framework designed by AB 1054 and AB 111 in the years to come and further its mission to drive reduction of utility-related wildfire risk.

Management Response to Recommendations

Recommendation 1: To reduce the number of power shutoffs, rather than just reducing their scope and impact, the Legislature should amend the shutoff reduction law to require that utilities describe in their mitigation plans the improvements that would be necessary to prevent shutoffs on the circuits routinely affected by them, such as installing covered power lines.

Response 1:

Energy Safety agrees that proactive power shutoffs, known as public safety power shutoffs, are inconvenient, expensive, and can have adverse effects on Californians and public safety. Energy Safety also agrees that utilities must make improvements to the electrical grid, commit to thoughtful and well-planned vegetation management, and harden powerlines to greatly reduce

the need for public safety power shutoffs. Currently, California Public Utilities Code section 8386(c)(8) requires that, as part of their mitigation plans, utilities identify circuits that have frequently been deenergized and the measures taken or planned to reduce the need for, and impact of, future deenergization of those circuits.

Energy Safety defers to the Legislature regarding this recommendation but notes that this
④ statutory framework was just amended in 2021. Energy Safety's authority is not limited to requesting information about the scope and impact of public safety power shutoffs. The law requires utilities to describe the measures taken or planned to reduce the need for these shutoffs. Energy Safety has operationalized this requirement in its Wildfire Mitigation Plan Guidelines. (See Wildfire Mitigation Plan Update Guidelines, Attachment 2: 2022 Wildfire Mitigation Plan Update Guidelines Template, pages 33-34.)

The current statutory framework requires the utilities to plan for continued, incremental reduction of the use of shutoffs. As utilities implement upgrades and improvements to reduce the risk of wildfires, the need for these events will decrease. As the Report explains, in 2012 the CPUC concluded that California Public Utilities Code Sections 451 and 399.2(a) give utilities the authority under state law to proactively shut off electric power to customers when necessary to
⑤ protect public safety. Directing utilities to eliminate public safety power shutoffs is outside the purview and authority of Energy Safety and may be at odds with existing law and CPUC precedent.

Recommendation 2: To address the risks and hazards resulting from future unplanned outages, the Legislature should amend the shutoff reduction law to include circuits frequently de-energized as a result of utilities' altering settings on equipment.

Response 2:

Unplanned outages are disruptive and can create cascading consequences to public safety. Similarly, overly sensitive protective settings can have significant, detrimental effects and must be balanced with maintaining a reliable grid. The aim of these protective devices is safe operation, but they must also strike a balance with reliability – two objectives that sometimes conflict. Energy Safety defers to the Legislature regarding this recommendation for statutory change but notes that the current statutory framework was created to balance the competing
⑥ objectives of reliability and safety. This recommendation prioritizes reliability over safety. While unplanned outages due to these devices affecting thousands of customers are inconvenient and present potential safety risks, those risks must be viewed in light of the safety, ecological, and climatological risks associated with catastrophic wildfires.

The "shutoff reduction law", the focus of this recommendation, applies specifically to planned shutoffs implemented as a wildfire risk reduction measure. The recommendation would include
⑦ in that law a subset of "unplanned outages" that are triggered by unexpected events, thus expanding the scope of the shutoff law, which was enacted to reduce *planned* public safety

power shutoffs. Further, Energy Safety can obtain the recommended information and will consider its appropriateness for inclusion in 2023 Wildfire Mitigation Plan Guidelines.

Energy Safety is proactively addressing protective powerline settings. Energy Safety's analysis of grid operations in 2022 will evaluate the efficacy of this strategy in terms of ignition reduction and assess utilities' long-term strategies to reduce the use of protective powerline setting measures. Through that process, Energy Safety will develop data and greater understanding regarding utilities' use of powerline settings as a safety measure and its impact on ignition risk reduction—information that will be helpful to inform policymaking on this topic. In the meantime, discouraging a utility from using their operator discretion and expertise in the use of protective devices to operate the grid as safely as possible could be dangerous. (8)

Recommendation 3: To ensure safety certifications encourage utilities to invest in safety and limit wildfire risk, the Legislature should require that as a prerequisite to issuing a safety certification, the Energy Safety Office's most recently completed compliance assessment of a utility's mitigation plan conclude that the utility has substantially implemented the plan.

Response 3:

The current regulatory framework balances incentives and deterrents to drive utility wildfire risk and achieve safety goals. As part of that framework, the safety certification process is *forward*-looking and designed to encourage and incentivize electrical corporations to invest in safety and improve safety culture within their organizations to limit wildfire risks and reduce costs in the future. (AB 1054, Section 2(f).) Notwithstanding its name, the "safety certification" was not designed by the Legislature to be a *backward*-looking mark of approval (nor a reward to be withheld as punishment for past conduct). (9)

Energy Safety has other tools to engage in backward-looking compliance review to hold utilities accountable in meeting their commitments. If utility efforts are found to be lacking, Energy Safety will issue notices of violation and defect directing corrective actions. Where appropriate, Energy Safety will refer cases to the CPUC for consideration of penalty enforcement. The CPUC also independently evaluates utility safety and can initiate its own punitive actions. (10)

Each of the seven documentation requirements Energy Safety evaluates during the safety certification review process looks at the utility's planned efforts to operate more safely. The requirements are forward focused. Among those requirements, a utility must demonstrate that it has an approved mitigation plan, it has agreed to implement safety culture assessment findings, it is incentivizing its leadership to prioritize safety through its executive compensation structure, and that it is documenting implementation of its current mitigation plan to prevent future ignitions. Utilities are incentivized to take these actions because obtaining a safety certification can affect the amount, if any, the electrical corporation must repay the Wildfire Fund for costs and expenses associated with a covered wildfire.

It is worth considering how the Report's recommendation would alter the careful balance the
⑪ Legislature struck in 2019 by transforming the safety certification process into a punitive enforcement tool and whether the structure of the safety certification process is well suited to be used as an enforcement tool. As explained in the Report, the "most recently completed compliance assessment" would be an assessment on mitigation plan actions from two to three years prior. Given the constantly evolving understanding of how best to address utility wildfire risk, any findings in the "most recently completed compliance assessment" may not be directly relevant or applicable to utilities' maturing wildfire strategies. Using the safety certification as a backward-looking, punitive enforcement action could undermine its value as a stabilizing incentive to invest in safety and, as the Report states, "support credit worthiness," which enables utilities to raise capital at a lower cost to make those investments.

⑫ The current safety certification regulatory framework established by the Legislature has only been operative for less than three years. Energy Safety respectfully suggests that it be given the time to drive the safety improvements it was created to achieve.

Recommendation 4: To ensure that utilities are targeting highest fire risk activities, Energy Safety should designate the prioritization of mitigation activities as a critical issue that must be addressed before it approves mitigation plans.

Response 4:

⑬ Energy Safety strongly disagrees with the Report's characterization of its 2020 and 2021 mitigation plan evaluation as having "failed to ensure that utilities focus mitigation activities in the areas of highest fire risk." Energy Safety has focused extensively on driving the utilities to develop their risk modeling capabilities so that the utilities can accurately prioritize their mitigation activities. The Report's recommendation that Energy Safety designate prioritization of mitigation activities as a "critical issue that must be addressed before it approves mitigation plans" fails to recognize the many factors that go into making such an evaluation. The Report
⑭ also confuses compliance assessments, which hold utilities accountable for *implementing* their mitigation plan, with the mitigation plan evaluation process, which holds utilities accountable for *planning* their mitigation activities.

In 2021, for example, Energy Safety experts designated PG&E's failure to provide sufficient information about its overhauled risk model a critical issue and subsequently issued a Revision Notice, which is Energy Safety's mechanism to require modification of the plan. Energy Safety experts conducted an exhaustive analysis of PG&E's Revision Notice response and revised plan. Upon completing its expert review, Energy Safety deemed that PG&E's revised plan was sufficient to determine that PG&E's updated risk model was significantly more robust and effective than its previous model. The approval simultaneously required PG&E to provide more
⑮ information and take further action to continue to improve on risk modeling. Energy Safety stands by its evaluation that PG&E's progress was sufficient to warrant approval of its

mitigation plan, and PG&E must address the issues highlighted in Energy Safety's decision in the next plan.

Energy Safety's mitigation plan approvals push the utilities to constantly think more deeply, be smarter, and be more rigorous in their efforts by requiring additional information and actions. In its inaugural year as WSD within the CPUC, the department used the 2020 mitigation plans to establish a baseline understanding of utilities' wildfire risk capabilities. Each utility was assessed to determine where it was in its maturity, and Energy Safety evaluated whether the plan was appropriate for that utility at that point in time while laying out the department's expectations for growth. In undertaking this analysis, WSD exposed weaknesses in the utilities risk modeling and prioritization that resulted in a significant effort on the part of the utilities to mature these areas. For example, PG&E revamped its risk model between 2020 and 2021, creating improved risk assessment outcomes. Risk-based decision-making and consequence evaluation is a nascent area that is continuously evolving in real time. Requiring a utility to achieve a yet-to-be-developed gold standard for risk modeling prior to mitigation plan approval would result in the denial of mitigation plans for years—a result that would deter, rather than foster, critical improvements. Without approved plans, the utilities cannot be held accountable for the progress promised in those plans and denial would prevent them from implementing incremental progress over their prior approved plan. Instead, Energy Safety evaluates utility improvement over the previous year and, if sufficient, approves the WMP while providing clear direction on how to mature the capability going forward. (16)

The evaluation of mitigation plans is separate from assessments of implementation and compliance. The Report notes that a Federal Monitor Report found that in October 2020 "PG&E completed the majority of its 2019 enhanced vegetation work in relatively low-risk portions of its high fire-threat areas and had not conducted any of its planned enhanced inspections of transmission structures in its highest threat areas." While the Report cites valid and serious concerns with PG&E's implementation of its 2020 and 2021 mitigation plans, Energy Safety is addressing those issues through its compliance process.[2] Energy Safety should not and cannot reject a utility's forward-looking plan because of actions the utility takes (or fails to take) while implementing its previous plan. (17)

Finally, as noted by the Report, Energy Safety is requiring "utilities to detail how their risk models will be used to inform how they prioritize mitigation activities" in the 2022 Wildfire Mitigation Plan Guidelines. The Report is utilizing this change to the guidelines as evidence that Energy Safety did not evaluate overall risk prioritization in the 2021 plans. However, while it is true that the 2021 Wildfire Mitigation Plan Guidelines did not explicitly require detail regarding (18)

[2] For example, as the WSD, Energy Safety conducted an audit of PG&E's 2020 Enhance Vegetation Management (EVM) program and found that PG&E did not sufficiently prioritize EVM work to reduce wildfire risk. The CPUC used the WSD findings in this audit to take an enforcement action and place PG&E in Step 1 of the Enhanced Oversight and Enforcement Process.

overall risk prioritization, each initiative required discussion of how utilities determined region prioritization. Energy Safety delved into risk models and prioritization during its evaluation process through follow-up data requests and by issuing a Revision Notice. The change to the 2022 Wildfire Mitigation Plan Guidelines serves to make it explicit that Energy Safety requires this information in plan submittals.

The Report is similarly critical of Energy Safety's 2021 internal review procedures document[3] because risk prioritization was not characterized as an example of a critical issue. However,
⑲ under the 2021 internal review procedures, Energy Safety had the flexibility to determine that shortcomings in risk prioritization constituted a critical issue. In fact, it did. As discussed above, Energy Safety determined risk prioritization was a critical issue that would have prevented approval of PG&E's plan and thus issued a Revision Notice. Energy Safety ultimately approved PG&E's 2021 Wildfire Mitigation Plan because the Revision Notice sufficiently addressed Energy Safety's concerns[4].

⑳ The flexibility of these procedures[5] does not prejudge the severity of any one issue as critical. The internal procedures serve as the underpinnings upon which Energy Safety can layer its expertise when conducting its evaluation. To prescribe the severity of an issue prior to evaluation would lead to a "check-box" effort. Under the internal procedures, Energy Safety's experts have discretion based on their technical knowledge to designate the severity of an issue as "critical" and trigger a Revision Notice. Energy Safety stands behind the comprehensive and extensive evaluation conducted by its team of engineers, scientists, firefighters, and utility experts and their conclusions.

Recommendation 5: To make mitigation plans more responsive to causes of fires and serious concerns raised through oversight mechanisms, the Energy Safety Office should require in its 2023 mitigation plan guidelines that utilities address issues identified by oversight mechanisms – such as external audits—in their mitigation plans.

Response 5:

㉑ Energy Safety agrees that, where applicable and as appropriate, utilities should account for and address recommendations from external entities—what the Report calls "oversight mechanisms" —in their mitigation plans. Energy Safety requires utilities to continuously assess their performance and implement lessons learned to make improvements over time. In fact, in the Wildfire Mitigation Plan Guidelines, Energy Safety requires utilities to discuss lessons learned in each section of the mitigation plan. Where a utility is subject to external oversight,

[3] Report relied upon an example in the 2021 internal evaluation procedures to make its conclusion.
[4] With the approval, Energy Safety required PG&E to provided additional information and take additional actions to continue improving risk prioritization in its subsequent filing.
[5] The 2022 internal evaluation procedures are currently in draft form.

Energy Safety expects that a utility addresses the findings and recommendations from that oversight entity.

The Report repeatedly cites the Federal Monitor as an example of an "oversight mechanism." It is important to note that the Federal Monitor was only applicable to one utility and ended its oversight role as of January 25, 2022. Specifying piecemeal oversight mechanisms that do not consistently oversee utilities across the state, may lead to a scattershot approach to wildfire mitigation oversight that cannot be repeated or applied with any consistency. This approach risks introducing inconsistencies in plan structures across utilities.

The department will evaluate the need for any changes to the Wildfire Mitigation Plan Guidelines, including changes to the Lessons Learned section, through its established annual process.

Conclusion

Energy Safety was created with a clear purpose to reduce utility-related wildfire risk and build sustaining safety cultures within the electrical corporations that run California's energy infrastructure. The Legislature created a novel and carefully balanced regulatory framework to empower Energy Safety to achieve this purpose. Energy Safety is implementing this new framework through first-of-its-kind oversight tools and innovative approaches to drive behavioral and organizational change. It will take time to realize the impact and ultimately success of these efforts due to the amount of wildfire risk utilities must overcome and the relentless pace of climate change impacts.

Energy Safety is committed to driving timely, meaningful, and effective changes to the way California's electrical corporations build, operate, and maintain their infrastructure. Energy Safety will continue to challenge them, question them, and demand continuous improvements to safety. Energy Safety expects California electrical corporations to reduce the number of ignitions caused by their infrastructure and eliminate all ignitions that result in catastrophic wildfires.

Sincerely,

Caroline Thomas Jacobs
Director
Office of Energy Infrastructure Safety

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COMMENTS

CALIFORNIA STATE AUDITOR'S COMMENTS ON THE RESPONSE FROM THE OFFICE OF ENERGY INFRASTRUCTURE SAFETY

To provide clarity and perspective, we are commenting on the response to our audit from the Energy Safety Office. The numbers below correspond to the numbers we have placed in the margin of the response.

The Energy Safety's Office's characterization of our perspective is imprecise. As we state in the Scope and Methodology on page 55, our audit focuses on the roles of the CPUC and the Energy Safety Office in ensuring a safe and reliable electrical system in California. The utilities were not the entities we audited. (1)

Although the Energy Safety Office believes that it has the authority to act on the concerns identified in the report, we question why it has not yet taken such action. As Figure 1 on page 6 shows, six of the State's largest wildfires, including the utility-caused Dixie Fire that started in July 2021, have occurred since January 2020, when the office's predecessor organization, the Wildfire Safety Division, was created. Given the damage that utility-caused wildfires have caused and the threat they continue to pose, a more proactive approach is necessary. Adding specific requirements to state law, as we recommend on pages 33 and 34, will prioritize utilities' efforts to ensure that these concerns are addressed. (2)

The Energy Safety Office's concerns about redactions in the draft report are unfounded. The draft report that we provided to the Energy Safety Office contained all the findings, conclusions, and recommendations that pertain to it since it became a separate entity in July 2021. Additionally, prior to releasing the draft report to the Energy Safety Office, we met with its staff, director, and legal counsel on several occasions and discussed all the findings, conclusions and recommendations that pertain to it since it became a separate entity. Throughout the audit, we explained to its staff and legal counsel that the Government Code sections 8545 and 8545.1 require us to keep all substantive information about the audit confidential until we publish our audit report. Consistent with the law, generally accepted government auditing standards, and our long-standing practice, we provided each audited entity with the text that pertains to it, but not with the text that pertains to other entities. Further, consistent with generally accepted government auditing standards, our reports undergo a rigorous process of quality reviews to ensure their accuracy and completeness before we publish them. (3)

④ Although the Energy Safety Office states that the statutory framework was amended in 2021, we believe that the hardships power shutoffs cause warrant the Legislature's consideration of how the statutory framework could be improved. From 2013 through 2021, power shutoffs affected 3.6 million individuals, and as we state on page 17, approximately 270 circuits were de-energized three or more times during different power shutoffs in the same calendar year. These recurring power outages, the impact of which we describe on page 15, illustrate the need for statutory changes to ensure that utilities rapidly identify the improvements necessary to prevent the need for power shutoffs in the future.

⑤ The Energy Safety Office misrepresents the nature of our recommendation. We did not recommend that the office direct the utilities to eliminate power shutoffs. As we describe on page 14, power shutoffs have proven effective at preventing possible ignitions during high wind conditions. Rather, our recommendation on page 33 focuses on taking steps to prevent the need for shutoffs. At no point in the report do we recommend eliminating power shutoffs as a potential mitigation measure.

⑥ The Energy Safety Office's description of our recommendation is inaccurate. Rather than accepting that either reliability or safety should be prioritized over the other, as the Energy Safety Office suggests, our recommendation focuses on identifying measures to improve safety, which in turn enhances reliability. Further, although the Energy Safety Office describes unplanned outages as inconvenient, according to the CPUC, as we describe on page 32, unplanned outages are more than a matter of inconvenience—they are disruptive, and for customers who rely on electricity to maintain necessary life functions, they can be life-threatening. These effects highlight the need for the Legislature to ensure that utilities are taking steps to address sections of line frequently de-energized as the result of these outages.

⑦ The Energy Safety Office's reference to the focus of the original law is not relevant to the issue that we recommend the Legislature address. Whether incorporated into this law or added as a separate section of law, the intent of our recommendation on pages 33 and 34 is to limit the impact on Californians of unplanned outages due to wildfire mitigation measures.

⑧ We disagree with the Energy Safety Office's perspective that our recommendation would discourage utilities from using their "operator discretion and expertise." Rather, it encourages the utilities to identify improvements that will increase the safety of the electrical grid and reduce the need for utilities to exercise that discretion and expertise. In light of the impact that these unplanned outages had on more than a half million Californians in 2021, it is unclear why the Energy Safety Office appears to be opposed to this recommendation.

We disagree with the Energy Safety Office's characterization of the safety certification process and have highlighted significant weaknesses in that process in our report. A safety certification process that focuses only on looking forward does not hold utilities accountable for actually performing the work to mitigate wildfire risk. Moreover, the Energy Safety Office's response does not address our concern that the requirements in state law are not sufficient to assure that utilities that are issued safety certifications actually implement their mitigation plans. As we describe on page 37, state law does not allow the office to deny a safety certification on the basis that a utility did not implement a prior mitigation plan. Linking the assessment of a utility's implementation of its mitigation plan to the issuance of its safety certification is a reasonable approach for ensuring the value and relevance of the safety certification process. Further, it is unclear how issuing safety certifications to utilities that fail to implement their mitigation plans would accomplish the Legislature's intent. (9)

We question the accuracy of the Energy Safety Office's statement regarding other tools for holding utilities accountable based on our finding that the CPUC does not use its authority to penalize utilities when its audits uncover violations. The Energy Safety Office asserts that where appropriate it will refer cases to the CPUC for consideration of penalty enforcement. However, as we state on page 47, the CPUC's practice is to issue penalties for significant issues, such as when individuals were hurt or killed, or where buildings were destroyed. Therefore, the Energy Safety Office's statement that it will refer cases to CPUC for consideration of penalty enforcement does not align with the reality of the CPUC's practices for assessing penalties. (10)

We disagree with the Energy Safety Office's statement that our recommendation would transform the safety certification process into a punitive enforcement tool. This process already requires that utilities meet certain requirements in order to receive a safety certification. Adding another criterion to those requirements will not fundamentally alter the nature of the safety certification process. Further, we are not suggesting that utilities' implementation of past plans be assessed against "the constantly evolving understanding of how best to address utility wildfire risk." Although the Energy Safety Office has not yet completed its first mitigation plan compliance assessment, we would expect the office's compliance assessments to determine whether utilities adhered to their plans. We would question the office's approach if it were to assess utilities' compliance with their plans in the manner that its response indicates. Finally, the practice of approving safety certifications based on mitigation plans that are not meaningfully linked to outcomes is not prudent. As an example, we describe on page 37 that when the Energy Safety Office issued PG&E's (11)

2020 safety certification, it noted concerns identified by oversight entities but nonetheless stated that PG&E had met the minimum statutory requirements for issuance of a safety certification.

⑫ The Energy Safety Office's response does not acknowledge the urgency of addressing the wildfire risk that California faces. As we state on page 7, the average wildfire size and the annual area burned have increased during the past several years. The issuance of a safety certification is intended to encourage utilities to invest in safety and improve safety culture to limit wildfire risks, as we describe on page 36. However, whether a utility substantially implements the projects in its mitigation plan has no bearing on the Energy Safety Office's decision to issue its safety certification, as we describe on page 37. Being given additional time to improve the existing framework, as the Energy Safety Office suggests, may delay holding utilities accountable for substantially implementing their mitigation plans and making safety improvements to help decrease the likelihood of utility-caused wildfires.

⑬ The Energy Safety Office's statement that it strongly disagrees with our report's characterization of its 2020 and 2021 mitigation plan evaluations contradicts its own assessments of those mitigation plans. As we describe on page 42, the Energy Safety Office found that PG&E did not describe in sufficient detail in its 2020 mitigation plan how it prioritized deployment of vegetation management initiatives, and the utility failed to demonstrate in its 2021 mitigation plan that it was properly prioritizing power line replacement and system hardening efforts. Further, as we reference on page 43, the Energy Safety Office also noted that SDG&E did not provide sufficient detail in its 2021 mitigation plan on how it prioritized high fire-threat areas for moving power lines underground and installing covered power lines. Although the Energy Safety Office states that it has focused extensively on driving the utilities to develop their risk modeling, we are concerned about its continued practice of approving utilities' mitigation plans despite having identified insufficient information to support their prioritization of mitigation activities.

Further, the Energy Safety Office's suggestion that our recommendation fails to recognize the many factors that go into a mitigation plan evaluation is incorrect. Although we are aware of the many factors that must be considered, we also recognize the critical importance of ensuring that mitigation activities are properly prioritized. As we describe on page 43, the Energy Safety Office's internal procedures already categorize some issues as critical items that must be addressed before it approves a mitigation plan. We recommend that the office consider the prioritization of mitigation activities to be one of these critical issues.

The Energy Safety Office's belief that we have confused the planning of mitigation activities with compliance assessments is incorrect. On the contrary, we recognize that these processes are distinct—separated by a significant gap in time—as we illustrate in Figure 11 on page 38. However, these processes are inextricably linked: the compliance assessment determines whether the utility has implemented the mitigation plan. Unless a utility's mitigation plan specifically identifies the nature and location of the work to be performed, it will not be possible for the office's compliance assessments to provide a meaningful determination of whether a utility substantially implemented its plan. Accordingly, we stand by our recommendation that until the Energy Safety Office designates the prioritization of mitigation activities as a critical issue that must be resolved before it approves mitigation plans, it cannot ensure utilities are targeting the areas of highest fire risk. (14)

Although the Energy Safety Office asserts that it stands by its evaluation of PG&E's 2020 and 2021 mitigation plans, its response does not address our concern that it determined the utility had not provided sufficient information on how it used risk modeling outcomes to inform how it planned to conduct various mitigation activities. Page 42 of our report acknowledges that in the office's review of PG&E's 2021 mitigation plan, it determined that PG&E made progress in updating its vegetation risk model. However, the office found that the utility failed to demonstrate that it was properly prioritizing other activities, particularly power line replacement and system hardening efforts. Further, other entities also identified issues regarding PG&E's prioritization of the mitigation efforts it performed. Based on its own descriptions of the weaknesses in PG&E's mitigation plans and the critical nature of the activities for which PG&E failed to provide sufficient information, it is unclear why the Energy Safety Office believes its evaluation was sufficient. (15)

The Energy Safety Office's comments do not align with our conclusions and recommendation. We did not recommend that utilities achieve a "gold standard" for risk modeling prior to mitigation plan approval. Rather, on pages 48 and 49 we recommend that the office designate the prioritization of mitigation activities as a critical issue. Without such prioritization, the Energy Safety Office cannot ensure utilities target the areas of highest wildfire risk. Notwithstanding the office's statement that the utilities need approved mitigation plans to be held accountable for the progress promised, if those plans do not contain sufficient detail, the Energy Safety Office will not be able to effectively assess whether utilities targeted activities in areas of highest risk for wildfires and hold the utilities accountable for performing those activities. (16)

⑰ We do not disagree with the Energy Safety Office's statement that it should not and cannot reject a utility's mitigation plan because of actions the utility takes while implementing its previous plan. Nor did we recommend that it do so. We described evaluations of utilities' wildfire mitigation work to illustrate that the Energy Safety Office identified concerns with mitigation plans, but it nevertheless approved them. Subsequently, its concerns were proven to be correct. Thus, instead of approving plans when the office identifies such concerns, it should require mitigation plans to include information on the prioritization of mitigation activities so that it can hold utilities accountable when it ultimately performs its compliance assessments of those plans.

⑱ The Energy Safety Office's response correctly notes that its 2021 mitigation plan guidelines did not explicitly require detail regarding overall risk prioritization. However, despite its claim that its 2021 guidelines required utilities to discuss how they prioritized initiatives by region, the office approved mitigation plans even when it determined that utilities did not provide sufficient information on how they prioritized those initiatives.

Further, the Energy Safety Office describes changes to the 2022 mitigation plan guidelines as evidence that it has addressed the concern we raise. Because these guidelines were in draft form at the time of our audit and thus confidential, we were unable to describe them in our report. When they are finalized, we look forward to reviewing the guidelines as part of our process for following up on the Energy Safety Office's implementation of the audit's recommendations.

⑲ In its response, the Energy Safety Office provides one example of when it determined risk prioritization was a critical issue for PG&E. However, it omits that it approved PG&E's mitigation plan despite its concerns that the utility failed to demonstrate that it was properly prioritizing its power line replacement and system hardening efforts, as we describe on page 42.

⑳ The Energy Safety Office's statement contradicts its own existing procedures, which already establish the relative severity of certain issues. As we describe on page 43, the Energy Safety Office's internal procedures classify some items as critical issues that must be addressed before it approves a mitigation plan and others as deficiencies that may be addressed in a subsequent mitigation plan. We recommend only that the Energy Safety Office elevate the prioritization of mitigation activities to be a critical issue. This recommendation is not intended to create a "check box" approach, but rather as we note on page 43, to have the office hold utilities accountable for conducting mitigation activities in areas of highest risk for wildfire.

The Energy Safety Office's criticism of our recommendation to require that utilities address issues identified by oversight mechanisms in their mitigation plans is inconsistent with other statements in its response. It states here that "where applicable and as appropriate, utilities should account for and address recommendations from external entities," but in the following paragraph it suggests that specifying oversight mechanisms that do not consistently oversee utilities across the State may lead to a scattershot approach and risks introducing inconsistencies in plan structures across utilities. The suggestion that it is problematic if different oversight mechanisms apply to different utilities contradicts the office's perspective on mitigation plans it described previously in this response. On page 75, it indicates that utilities are at differing levels of maturity in their wildfire risk capabilities, and that "Energy Safety evaluated whether the plan was appropriate for that utility at that point in time…" Consistent with the office's belief that it is appropriate to apply different considerations to utilities' mitigation plans based on what is appropriate for a utility at that time, it should consider whatever oversight mechanisms are applicable to that utility at that point in time.

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